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The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

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The OIL WEEKLY

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An example of
MISSION LEADERSHIP IN
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After long experimenting, Mission research engineers succeeded in developing the first really serviceable piston with replaceable rubbers. In fact, Mission succeeded so well that the Mission Piston quickly became the standard of the industry.

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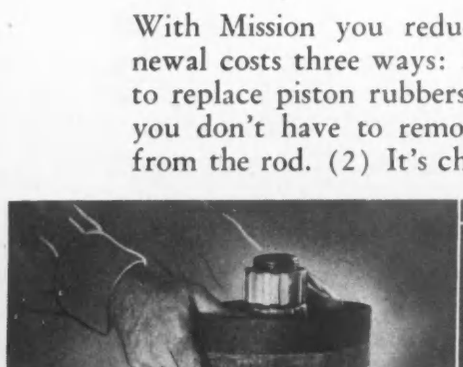
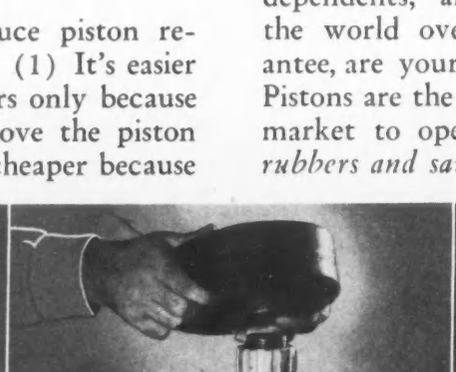
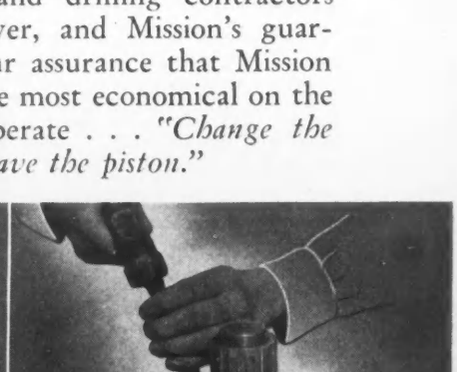


When the rubbers are worn, simply remove the old rubbers and save the piston body.



It's not even necessary to remove the piston from the rod. This saves you shut-down time when the rubbers are changed.



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THE CHANGING Panorama

Foreign Operations And Lasting Peace

SUBSTANTIAL increases in its activities and investments abroad are cited by Standard Oil Company (New Jersey) as "practical demonstrations" of its confidence that "American enterprise can help meet the needs of people everywhere and thereby serve the cause of lasting peace."

If there is to be a world at peace, substantial and steady progress must be made toward elimination of the underlying causes of war—chief among them poverty and want, prejudice, fear and the suppression of the rights of man, the company's statement said.

To this end Jersey Standard and other organizations doing business in many countries face responsibilities as business and industrial outposts of the American way to peace and prosperity.

"Within the framework of national policy as determined by the government and supported by the American people," the company said, "we can do much toward a better tomorrow by the example of our policies and actions."

Behind the company's day-to-day effort in meeting its responsibilities, the foreword continued, are these established beliefs:

"1) Restrictions on individual initiative and resource are not in the best interests of any people.

"2) Poverty and want are the enemies of peace as well as the enemies of business and industry.

"3) Peace is endangered when peoples are isolated economically, politically or socially.

"4) Because nations, like individuals, are too often the victims of prejudice and misunderstanding, people of any nation must have the facts if their judgments are to be sound; and business can help by avoiding secret arrangements and reporting frankly on all activities.

"If men, through science and machines, are to drive persistently toward the world-wide reduction of want and higher standards of living for all people, vastly increased quantities of oil must be found, brought to the surface, refined, and distributed to all parts of the world."

Shortages Factor

LATEST statistics on well completions go a long way toward explaining the growing acuteness of the shortage in casing. There has been such a sharp increase that well completion rates now are far above prewar levels, indicating that the demand for tubular goods has been at unprecedented levels for sometime.

The number of wells completed during March, 1947, (see page 62 this issue) were 18 percent greater than in March, 1946. During the first quarter of 1947, well completions showed the following increases: 7.2 percent above the first quarter of 1946; 20 percent higher than in the first quarter of 1945; and 5.7 percent larger than in the first quarter of 1941.

Footage, which is the more accurate gauge of demand for tubular goods, also was up sharply. Footage drilled in the first quarter of 1947 was 6.9 percent more than in the first three months of 1946, was 14.5 percent greater than in the first quarter of 1945 and was 15.7 percent more than in the first quarter of 1941.

All the wells completed in March, of course, were commenced sometime ago when orders for the tubular goods needed were placed. Hence, the growth in well completion rates was reflected in tubular goods demand well in advance of the increase shown by actual well completions.

The peak demand simply exceeds the ability of the tubular goods industry to make casing, tubing and drill pipe. No relief is in sight until new mill facilities are completed, and this will not be before sometime next year.

Continental Shelf's Vast Oil Reserves

THE geologic character of the Continental Shelf makes it reasonable to believe that this vast underwater plain possibly could yield at least 1000 billion barrels of oil should it become necessary to tap its resources, according to Wallace E. Pratt, noted petroleum geologist, and retired vice president and director of Standard Oil Company (New Jersey).

Pratt's analysis of evidence indicating the existence of crude oil in great quantities in the shelf's area of roughly 10 million square miles is presented in the current issue of *The Lamp*, publication of Standard Oil Company (New Jersey). As an address it was included in the 1946 Distinguished Lecture series of the American Association of Petroleum Geologists.

His estimate of the oil potential of the shelf is based on a close study of the shelf's character and an analogy with the land discoveries already made in the United States. To date 53 billion barrels have been obtained from sedimentary rocks having an aggregate volume of less than three million cubic feet. The estimated volume of the sediments which make up the shelf and the slopes of the earth is 20 times this figure, and Pratt says the sediments found in the land are probably a representative sample of the marine sediments. His estimate does not take into consideration additional oil discoveries expected to be made in the land area of this country, which many industry spokesmen, including Pratt, believe has as much oil remaining to be found in the United States as has already been discovered.

However, Pratt points out that as yet the resources of the Continental Shelf are of remote interest and will not assume real significance as long as the required supply of liquid fuels can be supplied at lower costs from other sources.

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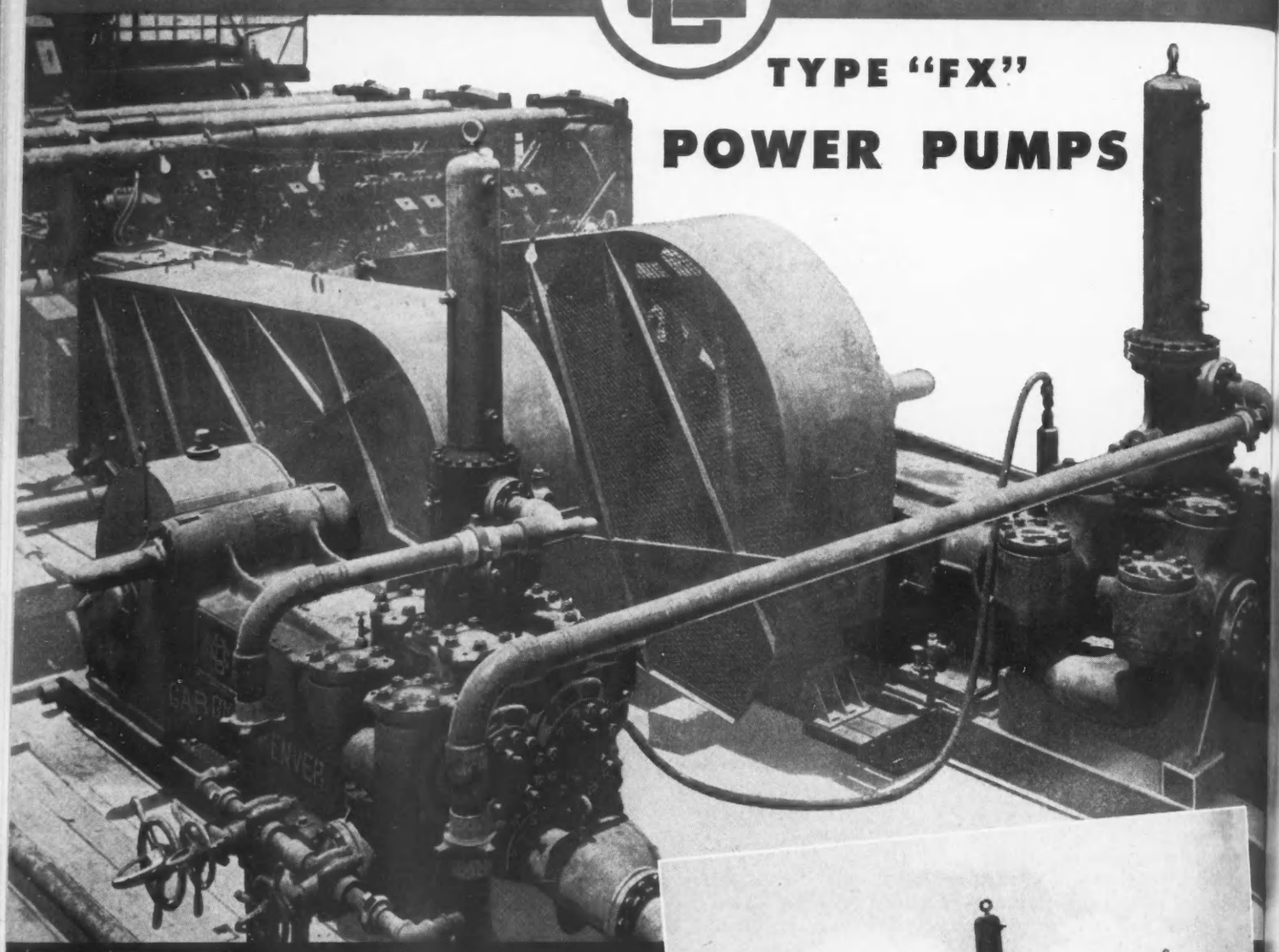
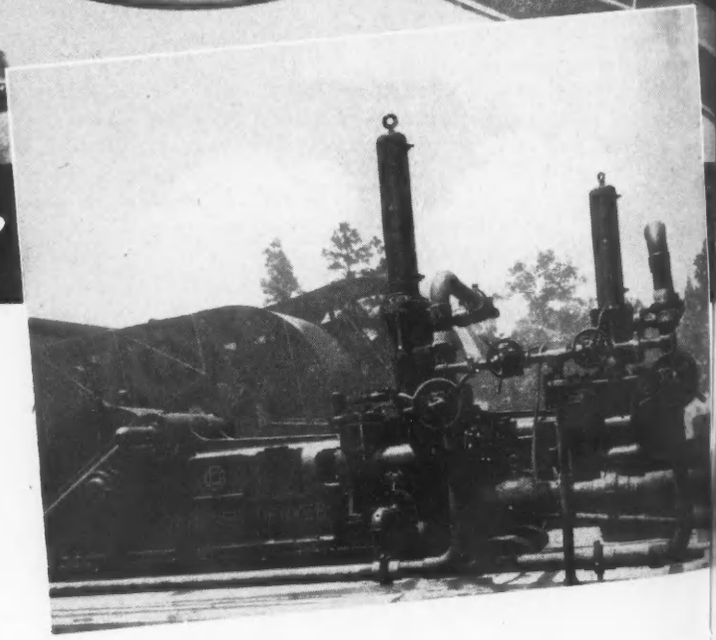
TYPE "FX" POWER PUMPS





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THE WEEK'S NEWS

SHORTAGES of materials, product and transportation which overhang the oil industry were reviewed by the National Petroleum Council at its spring meeting and steps taken to gather full information preliminary to attempting to work out remedies. Page 30.

Greek Aid and Oil—Approving grants of $400 million to Greece and Turkey, the Senate has written into the legislation a disclaimer that it will serve to bind the United States to support agreements made by American oil companies with companies or governments in the Middle East. Page 29.

U. S. Oil Imports—The United States as seen by the Department of Commerce is on an import basis so far as crude oil is concerned, with receipts of foreign oil running four to one over export.

Oil Compact Meeting—Industry problems including FPC policies, conservation work, and stripper well developments as well as a thorough discussion of demand factors engaged the Interstate Oil Compact Commission at its meeting last week. Story below.

Military Petroleum Needs—The National Petroleum Council was given a line-up of petroleum needs of the Army and Navy and was told that higher priority is required unless military activities be handicapped. Page 31.

Interior's Funds Slashed—The Oil and Gas Division would be wiped out and practically every activity concerned with oil would be hamstrung by cuts in Interior Department appropriations recommended by the House Appropriations Committee, which slashed $96,000,000 from the department's current appropriation. Page 31.

Natural Gas Act Changes—The Federal Power Commission will have a bonus of additional time in which to consider the position it will take on the Rizley bill to amend the Natural Gas Act as a result of a three-week interruption of hearings on the measure. Page 28.

Public Relations Campaign—The API board of directors approved an advertising campaign proclaiming "Petroleum Is Progressive" at its meeting last week in Washington. Page 29.

Compact Told 1947 Domestic Demand To Average 5.7 Million Barrels Daily

Varied industry problems and conditions were described last week at Birmingham, Ala., where the Interstate Oil Compact Commission held its quarterly meeting. Highlights:

U. S. crude oil demand during 1947 was estimated at 5.7 million barrels daily.

FPC policies were attacked and likewise defended.

Conservation practices and resulting developments were detailed in a paper by Governor Beauford Jester of Texas and read by Railroad Commissioner William Murray, Jr.

Stripper well projects and prospects were outlined.

The United States demand for crude oil during 1947 will average about 5.7 million barrels daily, according to predictions of the Compact Commission's Economics Advisory Committee as announced by Chairman Richard Gonzalez.

The figure, 7 percent above 1946, includes 400,000 barrels of imports. Transportation may prove to be the principal difficulty, and the committee urged an increased number of tankers and reduction in turn-around time to handle the oil.

"In the first quarter of 1947, demand was about 5,850,000 barrels daily, about 10 percent greater than in the same period of 1946, and 5 percent above the record demand during the war in the first quarter of 1945. The supply will include about 5 million barrels of domestic crude, 355,000 barrels of natural gasoline and condensate, and 450,000 barrels of imports. This would provide an increase daily in stocks of all oils of 240,000 barrels during the second and third quarters, totaling 44 million barrels, to care for next winter. Storage decline during the past six months in all oils was 31,500,000 barrels, and on March 31, stocks were 20 million barrels, or 4 percent less than reasonable levels as estimated by the committee.

"Full use of production, transportation, and refining capacities apparently will be required to meet demand, and some unusual measures may be necessary to move sufficient supplies to the Midwest," the committee said.

Along the East Coast demand for the entire year is up 170,000 barrels daily over last year, and was up 280,000 barrels daily during the first quarter of this year. Inventories of crude and products are at such low levels as will not permit any net withdrawal over the balance of the year in this district. Additional crude demand of 50 to 75 thousand barrels daily from Texas, Louisiana, New Mexico, Arkansas and Mississippi was forecast, with maximum efficient production from all fields in the area except West Texas where transportation is lacking. Refineries in the area must likewise operate at capacity to supply the demand.

IPAA Figures

Total domestic and import demand for all petroleum oils will drop from an estimated 5,850,000 barrels daily in the first quarter of this year to 5,560,000 barrels in the current quarter but thereafter will increase steadily, running to 5,670,000 barrels in the third quarter, 5,920,000 in the fourth quarter, and 6,130,000 in the first quarter of next year, IPAA forecast in a report to the compact.

Assuming that imports of foreign oil are reduced from the recent high level of around 490,000 barrels daily to the 1946 average of 370,000 barrels daily, the IPAA said, demand for domestic crude, estimated at 4,770,000 barrels daily in the first quarter, will average 4,940,000 barrels in the current quarter, 5,100,000 in the third quarter and 5,200,000 in the two following quarters. If there is no reduction in imports, however, the domestic demand figures will be reduced by 120,000 barrels daily.

The association Supply and Demand Committee which prepared the report, while admitting that the unprecedented increase in first quarter demand was completely unexpected, held that it was "nothing more than the continuing growth that has always been characteristic of this industry."

"In view of this fact," it declared, "the committee wishes to call particular attention to the estimated demands for domestic crude production because of the need for greatly increased exploratory and development effort in this country.

"Today we are drilling approximately 58 feet for every 1000 barrels produced. This is an increase over the wartime drilling which was restricted to 49 feet for every 1000 barrels of production but the present rate is subnormal as compared with the rate of 73 feet per 1000 barrels during the five prewar years 1935-39 and 87 feet for every 1000 barrels produced in the five pre-depression years 1925-29. To maintain adequate reserve to meet the increased demand shown in this report, the money and the materials must be available to permit a normal drilling program in relation to growing demands.

"This committee is confident that the oil needs of the future can be met by the domestic industry if it is given the opportunity and encouragement to do so. On the other hand, the committee feels that it would be detrimental to our national defense and industrial and economic welfare to rely on foreign oil to supply the expanding requirements of this nation."

Stripper Well Values

The newly created Stripper Well Committee held several meetings but was not able to complete a program to recommend. Considerable time was devoted to discussion of a director of the program who would correlate the material to be assembled and sent in by

the producing states. This material would consist of data on the number and location of stripper wells, probable reserves, general producing conditions and possibilities for secondary recovery operations.

The secondary recovery division of the compact meanwhile announced it planned to inform the public on the value of stripper well areas, promote more efficient methods of secondary recovery, encourage research in this field, circulate information through the industry and regulatory agencies, and foster training of technical training of men for this work. It is expected that much of the future work of the compact will be in this field.

FPC Policies Discussed

Industry representatives attacked FPC policies, which were hotly defended by Nelson Lee Smith, chairman of the commission.

Principal speaker was Rex Baker, general counsel for Humble Oil & Refining Company, who declared that the principal deterrent to capture and control of casinghead gas is FPC policy. He pointed out that in two cases carried to the United States Supreme Court, the commission had taken into consideration producing leases and gathering systems in establishing rate bases, and the court had sustained this view.

Baker pointed out that, of course, the producing company was likewise the company transporting the gas interstate. However, he said that oil-producing companies and gas-producing companies feared that they might be so classified and have their return on investments limited to 6½ percent on producing properties. He urged that this situation be clarified by Congress rather than by a ruling of the commission itself, since he thought such ruling might be beyond the jurisdiction of the commission and result in discrimination.

Commission Chairman Smith challenged this view, insisting that it applied only to those companies who conducted the entire operation from the well to the ultimate consumer through interstate lines. He insisted that it was not the policy of the commission now or in the past to attempt to declare these producers to be in interstate commerce.

"Gas waste control should remain a state and industry function—unless this proves unsatisfactory," he declared. He did not say who should determine whether it was satisfactory. The commission must gather information on reserves attached to interstate lines to determine whether the supply is sufficient, he pointed out.

Sound conservation has served to increase the ultimate recovery of oil and gas, has caused the development of technological advances in the industry and at the same time protected the individual property rights of the various owners, Governor Jester's paper declared.

Since it is proven that sound conservation aids in development, it behooves all oil producing states to take stock and inaugurate and carry out a sound conservation program, he pointed out.

"Production of oil and gas is vested with the public interest, and when a sound conservation program and policy is launched and carried out by the respective states there will be no cause for federal regulation, which is both unnecessary and undesirable," he said.

He added that the Interstate Oil Compact Commission was the proper agency to aid in coordinating the activities of the various states.

Gasification of Coal

First experiment in underground gasification of coal at the Alabama Power Company's Gorgas, Ala., mine clearly shows that the chance for success of the project is within the range of probability, Dr. Milton H. Fies of Birmingham, consulting engineer, told the compact.

"I do not doubt our ability to produce a gas of varying calorific value by gasifying coal in place, nor do I question the ability of the chemist to enrich it," Dr. Fies said. "The problem is basically one for the mining engineer, and upon him will rest the burden of maintaining conditions underground whereby a satisfactory gas can be produced with absolute regularity, and economically; and upon the chemist to make it suitable for use."

Emphasizing the importance of underground coal gasification, Dr. Fies said that liquid and gaseous fuel make up only 1.2 percent of the mineral fuel resources of the United States, and coal and lignite account for 98.8 percent of the total.

The next compact meeting will be held in August or September at some city in Montana, it was revealed.

Tank Car Movement Will Supplement Lines Crowded with West Texas Crude

Tank-car crude shipments from West Texas and Southeast New Mexico to supplement movement by pipe lines now operating at near capacity load will be stepped up beyond the wartime volume. This added market outlet will be reflected by higher production allowables in West Texas, which was restricted to 18 producing days in April with 2 extra days of production authorized for May.

Five regular tank car loading points in the two-state area averaged 7200 barrels daily last week, with oil consigned to refineries in Canada, McPherson, Kan., and El Paso. While this movement will continue, the heaviest shipments will be made by majors in supplying their refineries and market commitments.

Atlantic Pipeline Company has restored its 78-car capacity rack adjacent to its Midland station and tank farm site and effective April 26 began moving 50,000 barrels daily.

At Longview this oil makes connection with Atlantic's East Texas field 10-inch trunk line to Atreco, near Beaumont. The railroad company has posted a rate of 13 cents per 100 pounds for this movement.

Humble Pipe Line Company will start this week loading 15,000 barrels of West Texas sour oil daily over the Atlantic rack, this oil consigned to Humble Oil & Refining Company's Baytown refinery. This movement will be increased by 35,000 barrels daily about May 20 when facilities are available for the unloading of the increased volume at Longview or possibly Shreveport on consignment to Standard Oil Company of New Jersey.

Magnolia Pipe Line Company proposes to augment its Permian Basin oil shipments, currently averaging 82,750 barrels daily through sour and sweet crude carriers, by loading 5000 barrels daily of the intermediate grade of oil for consignment by rail to Magnolia's Fort Worth refinery.

Senate Group to Consider Natural Gas Act Changes

The Senate Interstate and Foreign Commerce Committee will open hearings tomorrow on revision of the Natural Gas Act, traversing the ground already covered by the similar House committee but in addition hearing officials of the Federal Power Commission.

The House committee recently devoted five days to the subject with most of the time taken up by witnesses in support of the bill after which it became necessary to lay aside the legislation for probably three weeks.

The Senate committee is prepared to make a quick study, and it is likely that fewer witnesses will seek to be heard than during the House hearings, when Chairman Charles A. Wolverton, after repeatedly urging that there be no duplication of testimony, required more than one-fourth of the score of gas industry witnesses to file their statements without oral testimony.

FPC officials are expected to agree that some of the reforms sought by the natural gas industry are desirable but holding that they could be accomplished as well by voluntary commission action as by congressional edict.

Big Inch Connections

Rogers Lacy, of Longview, Texas, has announced plans to construct two natural gas pipe lines that will supply the Big Inch lines recently acquired by Texas Eastern Transmission Corporation.

A 16-inch, 24-mile gas line will be constructed from the Carthage field, Panola County, to the Big Inch at Longview, at a cost of $1½ million.

The second line will be a 12-inch from Waskon field, southeastern Harrison County, to connect the Big Inch near Jefferson, a distance of 20 miles. Cost is estimated at $750,000.

Lacy also plans to build a natural gasoline plant in one of the fields, location not yet announced.

Sinclair Only Original API Board Member Left

Only one of the men who originally formed the American Petroleum Institute and was on its first board of directors is still serving, it was brought out at the spring meeting of the board last week when the resignation of J. Howard Pew was accepted because of his retirement. The single original member of the board now serving is Harry Sinclair.

Pew, who was vice president of the Refining Division, and three other retiring officials, O. D. Donnell, treasurer; George A. Hill, Jr., vice president of the Production Division; and Eric V. Weber, vice president of the Marketing Division, were presented with everlasting self-winding clocks as "symbols of faithful service."

Expansion of the marketing committee from 50 to 65 members to provide more widespread dealer and jobber representation was approved and four marketing representatives were added to the board of directors for the same purpose. The new members are Russell Williams, president of Individually Branded Petroleum Products Association, Indianapolis; R. L. Kent, Kent Oil Company, Salina, Kan.; Donald Dickey, president of Northwestern Petroleum Association, Minneapolis, and John L. Harper, Harper Oil Company, Long Island City, N. Y. The board did not discuss steel and other materials shortages because of the intensive consideration given the matter at the NPC meeting the preceding day, attended by many members of the board. A progress report on the legislation to revise the natural gas act was submitted by Frank M. Porter, president of the Mid-Continent Oil and Gas Association.

Progressive "Petroleum" Advertising Is Outlined

The American Petroleum Institute public relations committee last week took to the final steps, subject only to formal approval by the board of directors, which followed, to launch a $325,000 advertising campaign to tell the country what the oil industry is and does.

Following report of the progress made in district organization and other directions, the committee approved a recommendation that a nationally-known advertising firm be retained. The $325,000 is to finance the project from May 1 to December 31, but it is not anticipated that it will get under way before July with the most intensive phase during the autumn.

The committee was told that the advertising counsel which is directing the public relations work now has 15 full-time employes on the API account.

Whaley Re-elected

W. C. Whaley, vice president of Barnsdall Oil Company and general manager of its California operations, was reelected president of the Oil Producers Agency of California, at the Agency's annual meeting last week.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED April 26	April 19
Alabama	600	1,000
Arkansas	74,000	73,700
California	909,500	910,400
Colorado	36,750	36,000
Florida	550	550
Illinois	185,300	186,300
Indiana	18,250	18,500
Kansas	281,200	278,450
Kentucky	26,000	26,900
Louisiana	409,550	408,750
North Louisiana	96,100	95,300
South Louisiana	313,450	313,450
Michigan	43,050	43,500
Mississippi	88,050	86,700
Missouri	100	100
Montana	21,850	23,000
Nebraska	600	600
New Mexico	103,200	103,200
New York	13,100	13,200
Ohio	9,000	9,000
Oklahoma	386,450	376,900
Pennsylvania	34,400	34,800
Tennessee	25	25
Texas	2,166,150	2,166,150
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	20,750	20,750
Dist. 2—Middle Gulf Coast	158,000	158,000
Dist. 3—Upper Gulf Coast	480,600	480,600
Dist. 4—Lower Gulf-S.W.	241,950	241,950
Dist. 5—East Central	38,000	38,000
Dist. 6—East Texas Field	335,000	335,000
Dist. 6—Rest of Northeast	111,500	111,500
Dist. 7-B—North Central	37,000	37,000
Dist. 7-C—West Central	36,350	36,350
Dist. 8—West	485,950	485,950
Dist. 9—North	136,200	136,200
Dist. 10—Panhandle	84,850	84,850
West Virginia	8,000	7,750
Wyoming	115,000	112,500
Total United States	4,930,675	4,917,975

Military Petroleum Needs Said Increasing Steadily

Military petroleum products requirements for the remainder of the current fiscal year will run approximately 5 million barrels and for the 1948 fiscal year, beginning July 1, will be slightly less than 90 million barrels, according to calculations of the Army-Navy Petroleum Board. The 1948 schedule contemplates the purchase of approximately 64 million barrels in the continental United States and 26 million barrels from offshore sources.

Military requirements will increase steadily throughout the 1948 fiscal year, running 21,003,800 barrels in the first quarter, 22,893,600 in the second, 22,899,200 in the third, and 22,911,900 in the fourth quarter.

Total needs for the year will be, as now scheduled, 26,836,000 barrels of navy special fuel oil, 17,529,600 barrels of other heavy fuels, 17,050,400 barrels of navy diesel, 2,156,400 barrels other diesel fuels, 8,450,800 barrels motor gas, 409,600 barrels kerosine, 16,139,300 barrels aviation gasoline, 823,200 barrels lubricants, 295,600 barrels aviation lubricants and 17,600 barrels greases.

The A-NPB schedule for offshore purshases calls for 14,416,800 barrels of navy special fuel, 96,400 barrels other heavy fuels, 9,020,400 barrels navy diesel, 2,308,400 barrels motor gasoline and 5200 barrels kerosine, and possibly some aviation gasoline, although it is indeterminable at this time whether any of these requirements can be met from industry sources outside the continental United States.

Board representatives laid these figures before the National Petroleum Council last week and told the oil men flatly that unless military needs are given higher priority, Army and Navy activities at home and abroad will be severely impaired. Principal areas of shortage are in aviation gasoline, motor gasoline, Navy special fuel and lubricating oils.

Oil Company Support Given Mention In Greek Aid Bill

Approving legislation to grant $400 million in aid to Greece and Turkey, the Senate last week adopted an amendment to the bill offered by Senator Edwin C. Johnson of Colorado which may serve to abate the charge that the money is to be spent to protect American oil interests in the Middle East.

The amendment provides that the act not bind the U. S. "to support private agreements made between American oil companies and foreign governments or between American oil companies and nationals of foreign governments."

Officials concerned with foreign oil matters saw nothing in the amendment which changes in any way the established policy of the government with respect to operations of American oil companies abroad.

Your Vote Solicited!

ELSEWHERE in this issue of THE OIL WEEKLY (between pages 64 and 65) you will find a message from the editor and a request that you express an opinion on a prepaid self-addressed postal card which is provided for your use. We sincerely hope that you will fill out the card and return it to us, whether or not you like the particular feature in question.

It has been our policy on matters relating to editorial content to try to conform to the wishes of subscribers. Many of our best articles have been suggested by readers. In some cases we have abandoned features when we learned that subscribers were finding them of no particular value—and in such cases have published other features in their place. This is a rapidly changing world.

The feature on which we are currently inquiring has, we know, been popular with many readers, just what percentage we are now endeavoring to learn. It is an exclusive OIL WEEKLY feature which has been running 4½ years.

So—please turn to Page 64 and, after reading the editor's message and reviewing the feature in question, fill out the card and drop it in the mail. Thank you.

National Council Will Investigate Shortages of Materials and Products

Shortages, present and prospective, of fuel oil, gasoline, natural gas, line and casing pipe and other materials, tankers and tank cars, dominated the discussions of the National Petroleum Council in Washington last week.

Also before the council was the problem raised by the threatened extinction of the Oil and Gas Division by the withholding of funds, and while opinion as to the council's future under such circumstances varied, no specific date was set for the summer meeting. A resolution was adopted, however, authorizing the chairman to discuss appropriations with the proper congressional committees.

While NPC Chairman Walter S. Hallanan expressed the belief that the council will not necessarily die if the OGD goes out, since it was appointed by Secretary Krug and could work with him or with the Bureau of Mines or Geological Survey, he admitted that much of its vitality would be gone. OGD Director Max W. Ball, however, agreed with Secretary Krug that there would be no point to the council if there were no OGD.

The problem of shortages, as presented in committee reports and discussion in the meeting, shaped up along the following lines:

The shortage of casing and tubing is causing considerable confusion and is delaying drilling programs, J. E. Warren, president of the American Association of Oil Well Drilling Contractors, said in a telegram to Ball.

Supplies Short

Army-Navy Petroleum Board representatives reported that the military have been able to obtain only a small fraction of their current requirements of products and an even more serious situation exists with respect to forward requirements, with many former suppliers refusing to make any future commitments, threatening restriction of military activity.

The Bureau of Federal Supply has been able to cover only one-tenth of its midwestern requirements for products for essential governmental activities including on-shore military installations, veterans' hospitals, post offices, etc.

The Petroleum Rail Transportation Committee reported that there has been a decrease of 6000 privately owned Class 103 tank cars, including those in chemical service, in the past two years, and none have been constructed since 1942 and no steel is available now for construction. At least 7500 such cars are required to bring the fleet to its prewar numerical level.

Because of the tank car shortage, liquefied petroleum gases scarcity which prevailed last winter will be experienced again.

The Maritime Commission reported that Britain is lifting about 2 million barrels monthly from the Gulf Coast because there are not enough tankers to carry oil from the Middle East.

Federal Power Commission representatives warned of a possible shortage of natural gas next winter from New York to the Rocky Mountains. Construction projects approved and planned, if completed, would increase pipe line capacity by two-thirds, they said, but the actual construction this year will not meet the situation.

Acute Steel Shortage

Demand for distillate fuel, which increased from 712,000 barrels daily in 1945 to 746,000 daily last year is expected to run as high as 849,000 a day this year; demand for gasoline, which declined from 2,148,000 to 2,138,000 barrels daily between 1945 and 1946, is expected to jump to 2,252,000 daily this year, and demand for all products, which fell from 5,358,000 in 1945 to 5,321,000 in 1946, is expected to reach 5,650,000 daily.

The shortage of steel is the crux of much of the problem, which is aggravated by heavily increased consumption.

Council members believe that the situation would be tight with respect to gasoline next fall and fuel oils next winter, but there was a difference as to how severe the situation would be.

If mills producing pipe of 14 inch and larger diameter could get all the steel they could use, present projects for both oil and gas lines, both domestic and foreign, could be provided for in 3½ years, but at the present rate—the mills are operating at about 75 percent of capacity—it will take about 5 years, it developed.

For the second time in its history, it was brought out by B. L. Majewski, vice president of Deep Rock Oil Company, the oil industry is facing a major shift in demand. The first was a shift from a kerosine to a gasoline economy, he said, and now the shift is to an economy dependent jointly upon gasoline and distillate fuels, the latter no longer being a by-product of refining but one of the major derivatives with an increasing economic significance.

To meet the situation, the council approved a committee to ascertain the current production of crude, distillates and other products and the amounts available consistent with the principle of maximum efficient recovery.

Another committee will investigate the over-all facilities available for transporting crude and products, coordinating the findings with committees studying various modes of transportation.

A third committee will investigate U. S. refining capacity.

All committees are to report not only on existing facilities but also projects under construction or definitely determined upon.

The materials committee was reactivated to investigate steel shortages for casing, line pipe, compressors, refinery equipment and other industry materials, reporting on the probable quantity of such deficiencies and their probable duration.

A committee also will investigate requirements of the armed forces and other government agencies and to make recommendations.

Another committee will work with the OGD in recommending to the joint conference sponsored by ODT concerning necessity for adequate supplies of steel for essential tank car construction.

The Temporary Statistical Advisory Committee recommended that government agencies use API and AGA estimates on proved reserves, and that the OGD take steps to fill the lack of information on the various uses to which products are put. It also recommended that the API assume responsibility for the crude oil stock reports now issued by the Bureau of Mines.

On foreign operations, the committee suggested that some agency such as the Bureau of Mines gather statistics, by countries or areas, on production, refinery runs, etc. Quicker release of reports also was favored.

Other recommendations called for renewal of the former Bureau of Mines analyses of available and unavailable crude inventories and undertake a similar analysis of the four major product classifications; suggested that a survey now being organized by the Bureau of Domestic Commerce and financed by the industry through the API into the ultimate use of lubricating oils for 1947 be made an annual undertaking; that a breakdown of refinery statistics on gas oil and distillate fuel oil into heating oils, diesel fuels and gas oils be made; that the present report on natural gasoline and allied products be revised to show condensates separately; the Bureau of Labor statistics indexes on petroleum industry prices, wages and hours be reviewed with a view to improvement; that import and export statistics be improved both as to content and timing, and that a list and index of current sources of oil and gas statistics be prepared by the OGD or some other agency.

A special industry committee is being set up, as suggested, to aid the military agencies in procuring, analyzing and coordinating data necessary to meet military needs.

An interim report for the Committee on International Standards for Measurement outlined suggested standards for measurement by volume, expressing the belief that there is no operating or mechanical difficulty in expressing volumes in terms of liters, provided an adequate changeover period is allowed.

Texas Order for May

The Texas Railroad Commission has issued its May proration order fixing a net allowable of 2,397,815 barrels daily, a gain of 49,255 barrels over April.

The commission estimates operators will produce 6.50 percent less oil than allowed or 2,241,957 barrels actual. To this will be added 199,736 barrels of distillate and natural gasoline, for a state total of 2,441,693 barrels.

House Group Slashes Appropriations For Interior Oil Work; Krug Critical

The House Appropriations Committee last week denied the Oil and Gas Division any appropriation except a reduced fund for enforcement of the Connally "Hot Oil" Act, on the ground that Congress has never authorized its other activities. It suggested that in enacting the necessary legislation provision be made to collect from the industry for services rendered it, including "information which industry cannot get itself without violating the anti-trust laws."

For the duties laid upon it by President Truman in setting up the agency, the OGD had asked $245,000 for the coming fiscal year. It sought another $218,800 for enforcement of the Connally Act, which the committee cut to $124,000 because production and transportation of hot oil is now negligible. It suggested that violations of state allowables should be dealt with by the state authorities, pointing out that the Texas Railroad Commission is doing so with a high degree of efficiency.

The committee's action with respect to the OGD was representative of its treatment of every function of the Interior Department, which shaved $139 million off its $295 million budget and gave it $156,538,500 for the coming fiscal year as compared with $252,301,770 for the current period.

Some of the money cut off by the House committee is expected to be restored by the Senate, but department officials admitted they did not expect to have anything like their present appropriation and steps were taken immediately to streamline affected staffs.

Geological Survey appropriations, estimated at $18,105,000, were set at $9,113,230 as against $9,708,772 for this year. "Regardless of the fact that the war was concluded nearly two years ago, the committee has met stubborn resistance in its efforts to reduce the appropriations for this agency," the report said.

USGS was given $1,690,000 for geologic surveys, $310,000 less than currently, out of $3,135,000 requested for Secretary Krug's "inventory" of natural resources.

The committee granted $250,000 for investigation of mineral resources of Alaska, an increase over the current $35,700, but cut a $748,000 request for minerals on the public lands and naval petroleum reserves to $434,210, or $265,390 under this year.

The Bureau of Mines was declared to parallel the Geological Survey in that its funds were increased many times during the war period. Here, too, the committee said, it had received little cooperation in cutting back expenditures.

Approved was $3 million for the synthetic liquid fuel project, $2 million less than estimated, because, it said, the bureau will have an unexpended balance of $1,803,000 available. This would bring appropriations to more than $20.5 million and, accordingly, a contract authorization of $15 million provided in the 1946 supply bill will be cut back to $9.75 million so as to keep within the original $30 million originally estimated. There was no comment on the department's latest estimate that the project will cost $60 million and take three years longer than was originally anticipated.

The Bureau of Mines also was sharply cut back in its oil and gas investigations, the committee granting $579,000 out of $906,500 sought, bringing funds to $247,750 under the current year. The fund for helium utilization and research, which for several years has been $100,000 annually, was cut to $90,000.

Secretary J. A. Krug declared the reductions would cause a "tremendous set-back in the Nation's economy."

"The reductions do not even purport to involve any wasteful government spending," he declared, but rather a severe curtailment of our vital resources development. In the name of economy, the proposed program would economize the nation into bankruptcy of its natural resources."

Krug listed among the vital projects which would be affected the OGD, which is said is just beginning to produce results, and said that without the OGD there would be no purpose in continuing the National Petroleum Council. He said he would ask for legislation to continue the office "if necessary." Congress appropriated for it last year despite the fact that it was set up without specific legislation.

He cited the Geological Survey as one of the most important agencies of the department, essential if we are to find new sources of oil and minerals quickly. The reductions virtually close the proposed inventory of natural resources, he declared.

In the Bureau of Mines, he continued, there will be a 40 percent reduction in technical studies of primary and secondary recovery of oil, petroleum chemistry and refining, and petroleum thermodynamics, all not only valuable to the industry but essential to the Army and Navy in designing and selecting fuels for new types of equipment.

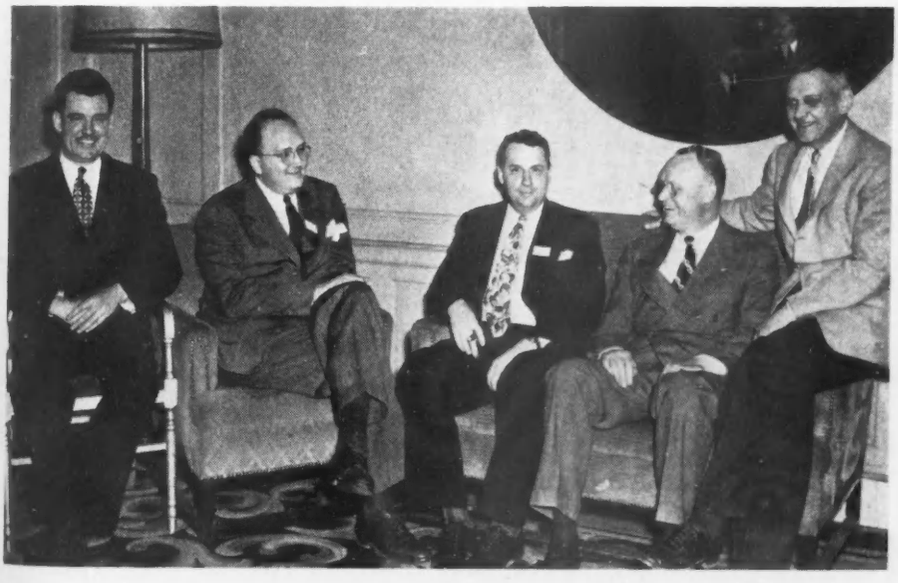
Hallanan Makes Reply

The National Petroleum Council is rendering greater service to the government than the Oil and Gas Division is providing the industry, NPC Chairman Walter S. Hallanan reported last week to assertions by the appropriations committee that the OGD's function is to provide information the industry could not get without violating the anti-trust laws.

Charging that the committee had "grossly distorted" the fact to support its action in withholding funds for the OGD, Hallanan said the division was not created at the request of the oil industry or any part of it and the NPC was set up at government request as an obligation the industry recognized to further the national welfare and security. Its service, he added, is rendered gratuously and at the expense of the industry and the men in it.

"It would seem that in order to eliminate any appropriation for the maintenance of the OGD, the appropriation committee has permitted some one to attempt to 'smear' the petroleum industry and its motives.

Division of Production Officers



Officers elected at spring meeting of the American Petroleum Institute, Production Division, Eastern District, held in Pittsburgh, April 17-18, are shown above, left to right as follows: H. R. Brankstone, Gulf Oil Corporation, Pittsburgh, secretary-treasurer; W. L. McCloy, Jr., Standard Oil Company, Cleveland, Ohio, vice chairman; J. V. Goodman, Equitable Gas Company, Pittsburgh, chairman; E. H. Tollefson, Hope Natural Gas Company, Clarksburg, West Va., vice chairman; R. B. Anderson, Columbian Carbon Company, Charleston, West Va., chairman advisory committee.

Wyco Lets Two Contracts For Wyoming-Colorado Line

Wyco Pipe Line Company has let contract for 271 miles of 8-inch products pipe line running from refineries in the Casper, Wyo., area via Cheyenne to Denver, Colo. Allred-Enix Construction Company will build the northern part of the line extending from Casper to a point north of Cheyenne and Pacific Pipe Line & Engineer's, Ltd., will construct the southern half.

Wyco is owned jointly by Standard Oil Company (Indiana), The Texas Company and Socony-Vacuum Oil Company. Stanolind Pipe Line Company is acting as agent for Wyco in supervising construction.

Construction is expected to start soon and with fall completion scheduled.

The new products line will deliver gasoline and distillate fuels to the Denver terminal and a 3-mile, 6-inch extension from the main lines will make deliveries to the Cheyenne terminal.

Texas-Detroit Pipe Line Fight Resumed Before FPC

Fight against the new Texas-Detroit pipe line sponsored by Michigan-Wisconsin Pipe Line Company is not yet over. Panhandle Eastern Pipe Line Company, with which the new line would compete, and the National Coal Association, United Mine Workers, City of Detroit, Michigan Docks Association, and 78 railroads, have asked FPC for reconsideration and withdrawal of certificate.

On November 30, 1946, the FPC authorized Michigan-Wisconsin to construct the 1069-mile line system and a supplemental order in February determined Panhandle's rights and duties relative to sales of gas in the Ann Arbor and Detroit areas.

Panhandle's current application declares that the company is aggrieved in a number of respects and that Panhandle has now asked FPC authorization to construct additional facilities.

Kansas Looping Project Work Is Well Under Way

Construction is well under way on 66 miles of 26-inch loop line for Natural Gas Pipeline Company of America in the vicinity of Garfield and Wilson, Kansas. Contract for the loop is held by the J. R. Horrigan Construction Company, Houston. All pipe for the loop has been obtained.

This looping is part of a $23,493,987 expansion program by the Natural company and Texoma Natural Gas Company to increase capacity of their lines from 349 million to 484 million cubic feet daily.

Included is a 5000-horsepower compressor station near Hooker, Okla.; 39 compressor units in existing stations; 110 miles of 24- and 26-inch loop; a 1500-horsepower compressor station in Moore County, Texas; nine compressor units in a station near Fritch, Texas; and 10½ miles of 26-inch and 15½ miles of 16-inch line in Texas.

Magnolia Contracts

Magnolia Pipe Line Company has awarded contracts to three firms for the construction of its 647-mile 20-inch crude line from Corsicana terminal, junction of its East West North and South trunk line systems, to Patoka, Illinois, where it will connect with its East-West 10-inch carrier between Wood River, Ill., and Lima, Ohio. Oklahoma Contracting Company, Dallas, will construct four sections totalling 428 miles while the H. C. Price Company, Bartlesville, and Eastern Construction Company, Inc., Dallas, will construct 111 miles and 108 miles respectively.

Pipe will be available to start construction about May 15 with completion dependent upon pipe deliveries. The carrier will operate initially with four booster stations at a capacity of 105,000 barrels daily but additional units can step up the capacity to 150,000 barrels.

North Texas Gathering

Fain & McGaha, owners of 25 producing wells with an allowable of 1100 barrels daily in the Daume and East Holliday areas, Archer County, North Texas, are installing a gathering system and 10,000 barrels of storage. The partnership has contracted to deliver its production for a period of years at the posted price, plus an allowance of 10 cents per barrel for gathering the 40-43-gravity crude. Substantial producers in other fields within the district have been solicited repeatedly by purchasers offering contracts on similar terms.

PIEA Meeting

Nineteenth annual meeting of the Petroleum Industry Electrical Association meeting with the Petroleum Electric Supply Association will be held in Houston May 6 through 8 at the Rice Hotel. General Chairman is J. F. Collerain, Houston Pipe Line Company, Houston, vice president of PIEA.

The first day and until noon on the second day will be taken up with registering and business sessions. Technical sessions will start at noon May 7 and run through May 8 with talks on electronics, influence of new materials on equipment, prospective use of electrically driven centrifugal compressors, etc.

Dow Buys Gas Production

Brazos Oil Company (Dow Chemical Company subsidiary), has purchased from The Pure Oil Company et al, their unitized block and all producing wells in the Collegeport field, Matagorda County, Texas. Also Continental Oil Company has sold to the same company its acreage outside the unitized area. The unitized area includes slightly more than 6000 acres and seven producing gas wells, with Pure operating the unit. It is reported that the gas from the field will be used for Dow industries in the Freeport area.

Two Companies Seek Permit To Extend Gas Facilities

United Natural Gas Company has applied for authority to construct a 20-inch extension of its present line in Beaver County, Pa., to connect with the Big Inch lines in Green County at a cost of $3,737,718 in order to obtain critically needed additional gas supplies for next winter's demand.

In another application United Gas Corporation seeks approval for construction by an unnamed subsidiary of approximately 1530 miles of pipe line, with necessary compressor stations, at a cost of $57,236,000, from near Hattiesburg, Miss., through Alabama, Georgia, Northern Florida and southeastern South Carolina, to provide natural gas service to a number of communities in these states. Gas supplies for the new system would be purchased from United Gas Pipe Line Company.

New Line to Permit More Gas for Pittsburgh Group

Temporary authority has been granted United Fuel Gas Company by FPC to construct 70 miles of 20-inch natural gas transmission line and auxiliary facilities in West Virginia at a cost of $2,970,000. The project would complete a single high-pressure transmission line extending from Cobb compressor station in Roane County, West Virginia, to a connection with a line of The Manufacturers Light and Heat Company in Monongalia County, West Virginia.

The company will begin construction immediately so that it can be completed by June 1 in order that gas may be delivered to the Pittsburgh group through Manufacturers for storage purposes this summer with a look ahead for heavy winter demand.

Progress Reported on Various TGT Projects

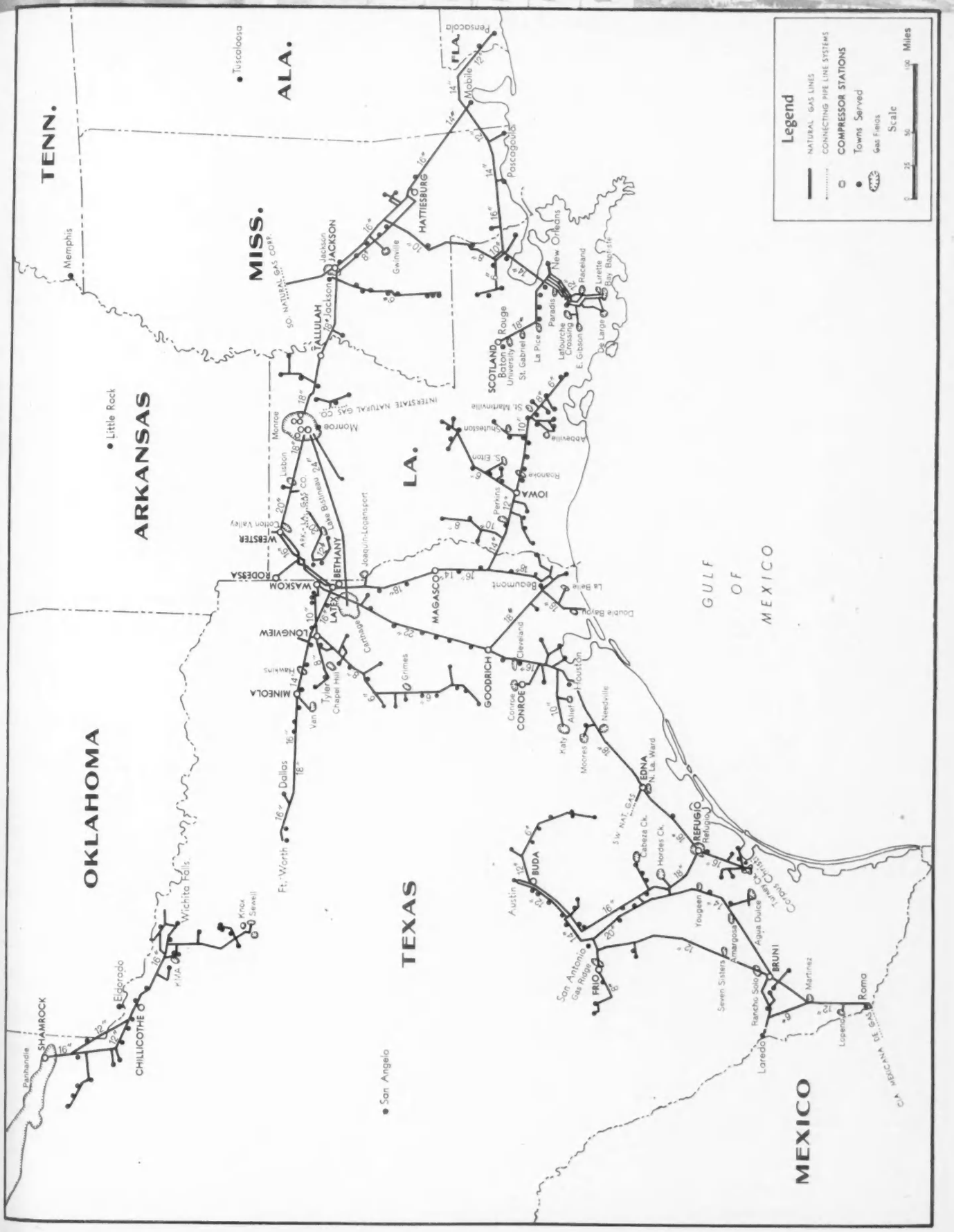
Tennessee Gas and Transmission Company's 95-mile 16-inch natural gas line from Nueces County, Texas, to the San Salvador field in the Rio Grande Valley, is 70 percent complete and tentative completion date for construction has been set as May 20. This extension to TGT's main transmission line will have a capacity of 96 million cubic feet of gas daily and is being built by the Associated Contractors and Engineers, Houston. The line is being coated with coal-tar enamel and wrapped, cathodic protection will be added later.

Work is progressing on TGT's expansion and looping program along its main transmission line from South Texas to West Virginia. Construction is under way on new compressor stations at Victoria and Fostoria (near Cleveland), Texas, and Natchitoches, La. Stations at Natchitoches and Fostoria are 60 percent complete and will be put in operation sometime during the summer. They will be equipped with six 1600-horsepower compressor engines. Construction on the Victoria station is not so far advanced. Here three 1600-horsepower compressors will be installed.

Pipe Lines of the U. S.

United Gas Pipe Line Company

12th of a Series



RECENT EXPERIMENTS IN

Air-Gas Drive

By D. E. MENZIE, R. F. NIELSEN, and S. T. YUSTER

THE question has been raised on several occasions as to the role which absolute pressure plays on the characteristics of oil recovery during an air drive. Inquiries have been made as to whether the volumes of air or gas required for a given recovery are a function of absolute pressure. From a theoretical standpoint one would expect the same volume of gas measured at the mean pressure, under the same gradient, to be required to produce a given quantity of oil regardless of the absolute pressure. In an attempt to gather information on this subject the following experiments have been performed.

A 13-millidarcy (average permeability) long core of the Venango sand had been covered with lacquer and prepared for use.[1] The core, after being 100 percent saturated with a close-cut oil (specific gravity of .805, viscosity three centistokes at 25° C., was mounted with appropriate end plates. On the downstream end of the core was placed the following equipment: A back-pressure regulator, the usual reservoir for collecting the oil production, and a wet test meter for measuring the flow of air through the core. The back-pressure regulator was used to maintain a given back-pressure on the producing end of the care.

Pressure Distribution

Figure 1 shows the pressure distribution along the core during some of the air-drives. As will be noticed, the pressure differential of each drive was held constant, i.e., 50 centimeters of mercury pressure drop across the core. The bottom curve represents the run of 50 centimeters of mercury pressure above atmospheric at the input end of the core and atmospheric pressure at the producing end of the core. The next curve is a plot of the pressures during the 100 centimeters of mercury input pressure and 50 centimeters of mercury pressure held at the producing end of the core. The upper curve of the series shows the distribution during 150 centimeters of mercury input and 100 centimeters of mercury back-pressure run. From Figure 1 it is apparent that the pressure distributions are quite similar for all runs.

Figure 2 is a plot of the oil saturations in the core vs. time for each of the previous runs described. It can be seen that the curves for each of the runs fall along a single line within the limit of experimental error. Hence the absolute pressure of the air drive has no effect on the time required for the drive.

Figure 3 is a plot of the oil saturations against gas volumes produced in pore volumes of the core. The solid lines are the curves of the gas volumes measured at atmospheric pressures. The 150 to 100 centimeters air drive was the least efficient for a given gas volume, measured at standard conditions, passed through the core. The 50 to atmospheric run is the most efficient and the 100 to 50 run falls between the two. The broken curves are the results of correcting the gas volumes to the absolute mean pressure of the core for each run. Thus the 50 centimeter to atmospheric pressure gas volumes were corrected to a mean gauge pressure of 25 centimeters of mercury. The volume of the 100 to 50 centimeters run was corrected to 75 centimeters of mercury mean pressure, and the 150 to 100 volume was corrected to 125 centimeters of mercury mean pressure. It can be seen that the corrected gas volume curves fall on a single line within experimental error. Thus it is shown that the same gas volumes measured at the mean pressures of the runs are required to arrive at the same oil saturation.

This study of absolute pressures reveals the need of correcting gas volumes to mean pressures when interpreting data during an air drive.

In connection with the above study of the effect of back pressure, it is of interest to compare the amounts of energy required for recompression of the air or gas when the same pressure drop is employed at different back pressures. For convenience, consider two cases, one in which the injection pressure is 100 pounds per square inch absolute and the pressure at the producing well 200 psi, and the second in which these are 300 and 400 psi, respectively. Since the pressure drop is the same in the two cases, then if the other physical factors are the same, the gas volumes for equal times are the same if corrected to the mean pressures, 150 psi in Case 1, and 350 in Case 2. Assume this corrected volume to be 1000 cubic feet. Applying the formula for single stage "polytropic" compression,

$$\text{Work} = \frac{n\,P_1\,V_1}{n-1}\left[\,R^{(n-1)/n} - 1\,\right]$$

where n is assumed to be 1.3, R is the compression ratio, and V_1 is the volume (1000) corrected to P_1, we obtain in Case 1

$$1.3 \times 100 \times 144 \times 1000 \times \frac{150}{0.3 \times 100} \times (2^{.023} - 1) = 1{,}500{,}000 \text{ ft. lbs.}$$

and in Case 2

$$1.3 \times 300 \times 144 \times 1000 \times \frac{350}{0.3 \times 300} \times (1.33^{.023} - 1) = 1{,}450{,}000 \text{ ft. lbs.}$$

Thus, considering mechanical and other factors such as solubility and supercompressibility, there is no saving in energy requirements by maintaining a higher back pressure with the same pressure drop. Some advantages may, however, be realized if, as is done in some cases, the energy is utilized in lifting the oil.

Effect of Water

In a paper presented by Yuster and Day,[2] at the 1946 Spring API meeting in Pittsburgh some experiments were described relating the effect of connate water to air-gas

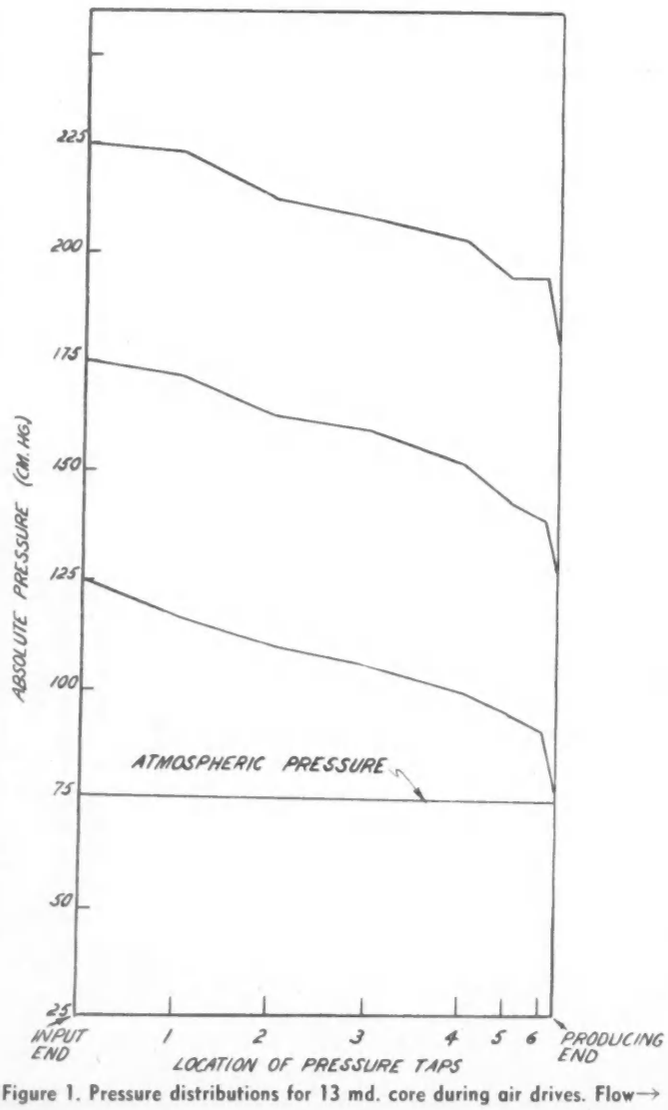


Figure 1. Pressure distributions for 13 md. core during air drives. Flow→

Presented at the Tenth Annual Secondary Recovery Conference, School of Mineral Industries, The Pennsylvania State College, State College, Pennsylvania.

Recovery

drive recovery. Figure 4 is a graph of percent liquid saturations versus gas volumes for some of the results of this work. The solid line is a curve during an air drive in which the core was originally:

50 percent oil saturated
40 percent water saturated
10 percent air saturated.

The dotted line is a curve of a similar air drive in which the core was 100 percent oil saturated. In either case only oil was produced during the drive. This curve was presented at that time to show that the water saturation would substitute for a portion of the residual oil saturation of a completely oil-saturated core; i.e. the water should be concentrated in the smallest pores and channels just as the residual oil of a completely oil-saturated core.

The data in Figure 4 have been replotted on an oil saturation basis in

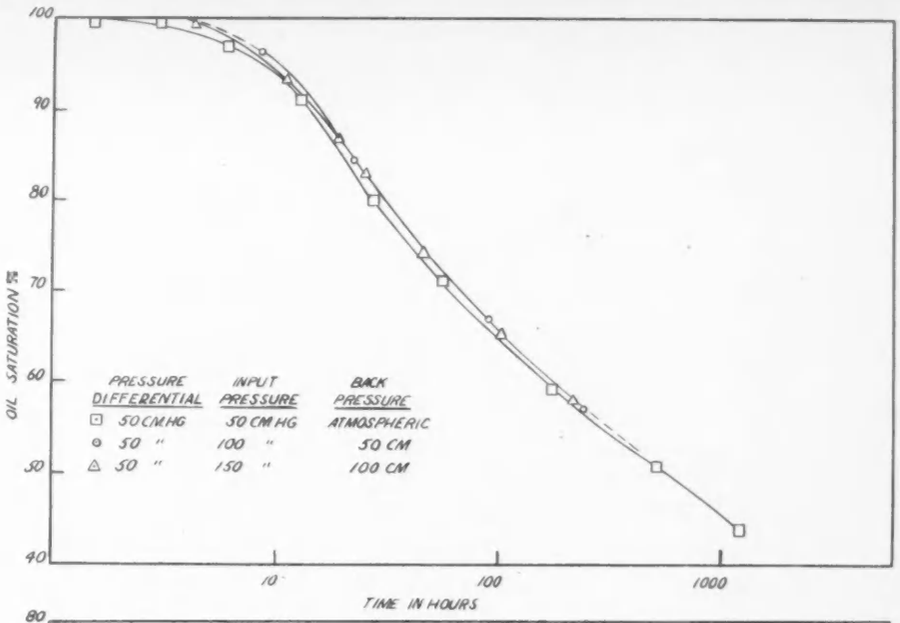


Figure 2 (upper right). Oil saturation vs. time for 13 md. core during air drive.

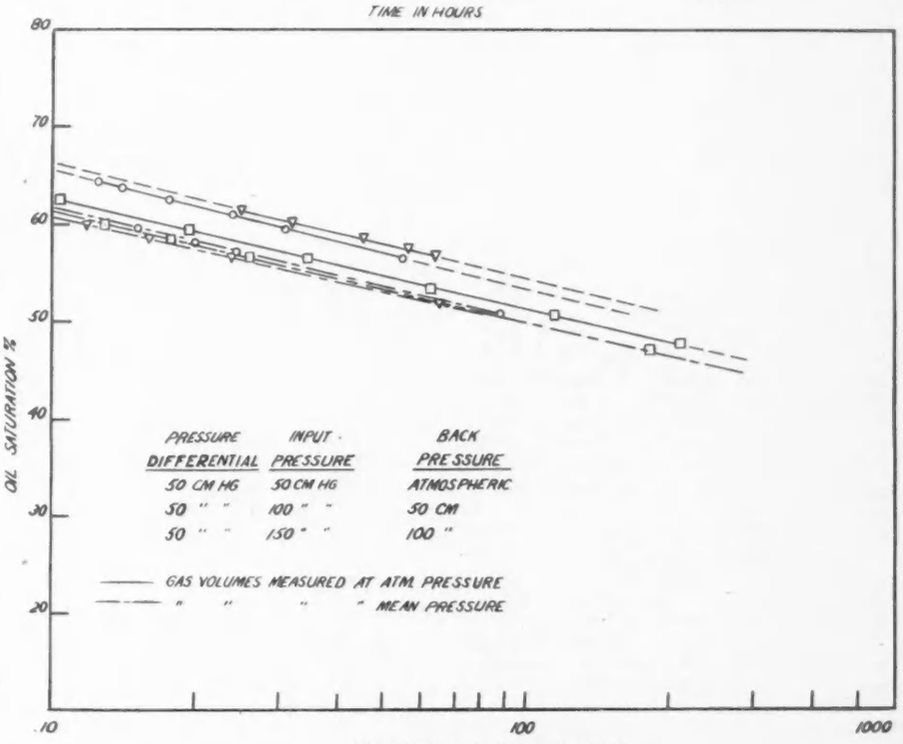


Figure 3 (center). Oil saturation vs. gas volume, 13 md. core during air drive.

Figure 4 (lower left). 1.3 lbs./sq. in./ft. air-drive on 800 md. core.

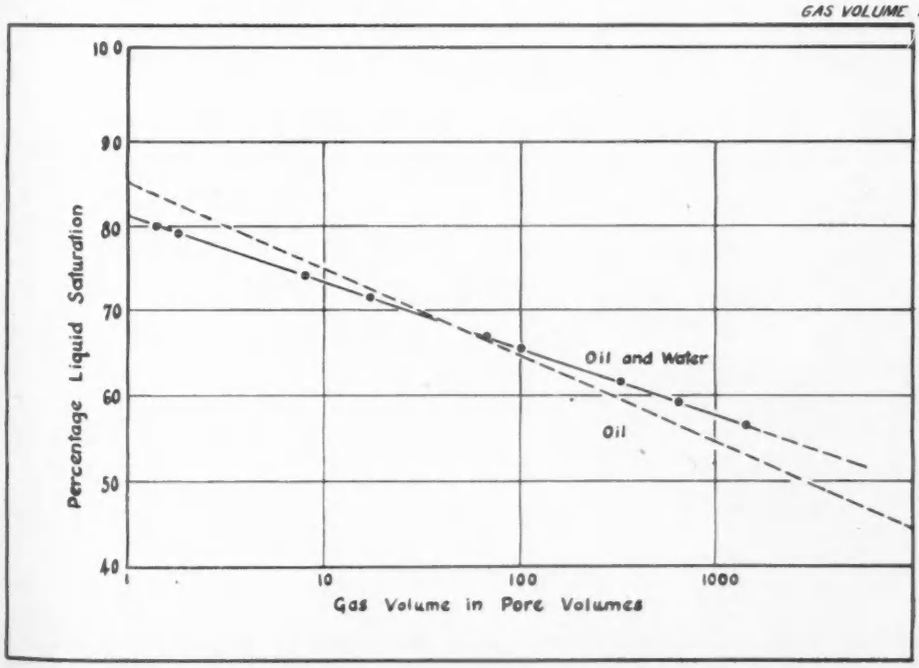
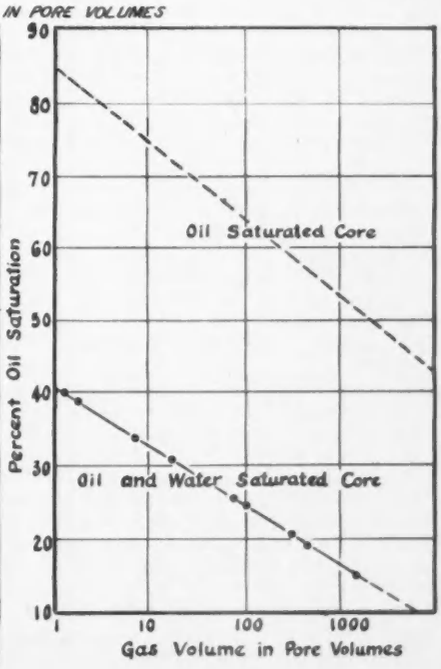


Figure 5 (lower right). Effect of water content on 13 psi/ft. air drive on 800 md. core.



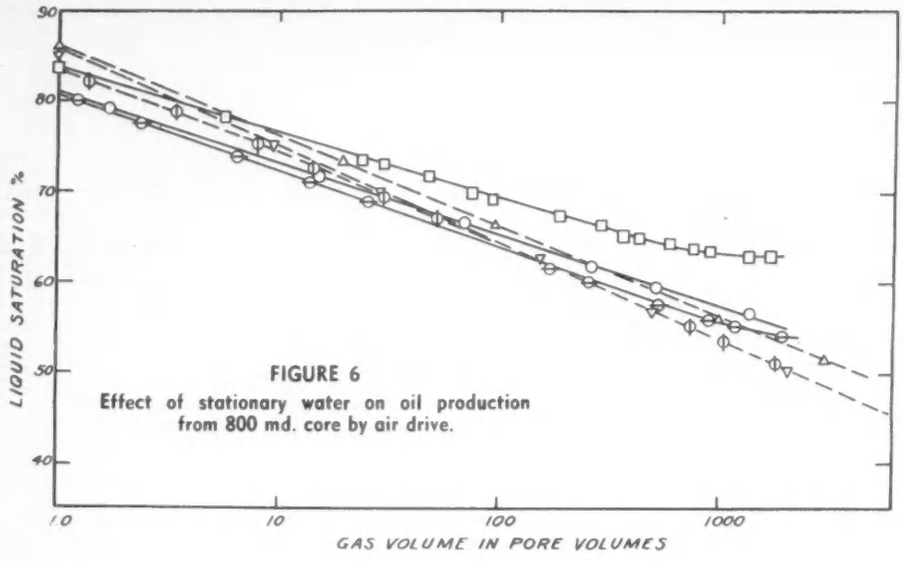


FIGURE 6
Effect of stationary water on oil production from 800 md. core by air drive.

△ 0.65 lbs/sq.in/ft. Initial Sat 100 % Oil
▽ 1.29 " " " " " " 100 % "
⌀ 2.58 " " " " " " 100 % "
□ 0.65 " " " " " " 53.5 % " 42.0 % Water 5.4 % Air
○ 1.29 " " " " " " 50.0 % " 40.0 % " 10.0 % "
⊖ 2.58 " " " " " " 51.6 % " 41.0 % " 7.4 % "

Figure 5. It was pointed out that the presence of water in a sand makes possible oil recovery in cases where it might otherwise be impossible. The water makes the core behave as if it had a much higher oil saturation. All this is subject to the condition that the sand is preferentially wet by water; i.e. the water is contained in the smaller channels and production by air-drive would result in a residual saturation made up of almost all the original water saturation.

Conclusions from Figure 4 and 5 are that this water saturation has substituted for a portion of the oil which would have been left behind had the production been from a completely oil-saturated sand. Figures 6 and 7 shows the results* of runs made at two other pressure gradients in addition to the runs of Figures 4 and 5.

It was concluded then, that the recovery of oil would be more complete in a sand containing both water and oil than in a formation which contains oil alone. As a corollary to this it was suggested that the higher the connate water saturation, the more complete would be the oil recovery. This is only partially true since there is a limiting range to the water saturation above which water will be produced along with the oil.

Since the connate water is in the smaller capillaries it tends to hold the residual oil out in the channels where the moving gas can get at it. All this raises some interesting possibilities with respect to oil recoveries from sands having relatively low connate water saturations. If such sands were water wet and if it were possible to introduce water into the sands in a manner which would increase the water saturation without water flooding it, the residual oil would be pushed into the larger channels. The gas or air drive could then move the oil to the producing well.

A laboratory study was made on a long core of the Cow Run sand with an average permeability of 800 millidarcies. The core after being fully extracted was prepared as described in previous papers.[1,2] The core was then 100 percent oil saturated with a close cut oil of specific gravity of .805 and a viscosity of three centistokes at 25° C. The porosity was found to be approximately 19 percent and the core had a pore volume of 433 cubic centimeters. The core was mounted with appropriate end-plates such that air could be applied at one end of the core and oil could drain from the other end. A wet-test gas meter was also placed at the producing end of the core to measure accurately the amount of air produced with the drive.

After being 100 percent oil saturated, the core was driven with air at a pressure of 20 centimeters of mercury or 1.29 pounds per square inch per foot gradient. Figures 8 and 9 are curves of time and gas volumes versus oil saturations for this run as compared with a similar 100 percent oil saturated, 20 centimeters of mercury air-drive.[3] The slight variations in the positions of the curves may be due to the intervening runs which have been performed on the core. The shapes of the curves in general are similar.

After approximately 2000 pore volumes of gas had been driven through the core and 280 hours had elapsed, the oil saturation was reduced to approximately 49 percent. This is point "A" on Figures 8 and 9. The core had then been considered produced to an economic limit, for as can be seen by the curves, the saturation of the core was being reduced only slightly with large volumes of air being injected. Under actual field conditions a well of these characteristics would be abandoned.

In an attempt to decrease the residual oil in the core the following procedure was adopted. A slug of distilled water equal to 18 percent of the pore volume of the core was forced into the core under the same pressure differential (i.e. 20 centimeters of mercury) as the original air drive and the core was allowed to stand for a given period. It was hoped that the water would distribute itself throughout the core and, in doing so, would displace oil into the larger or more open channels. This is apparently what happened, for when a 20 centimeters of mercury pressure differential air-drive, which was the same as had been applied previously, was again ap-

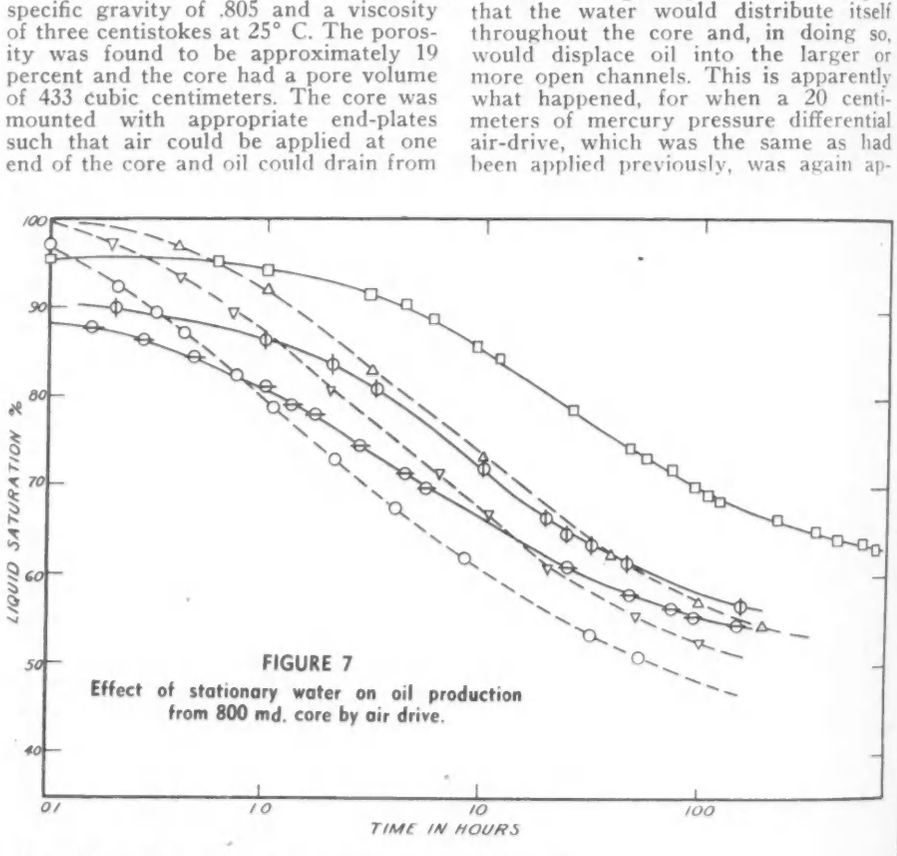


FIGURE 7
Effect of stationary water on oil production from 800 md. core by air drive.

△ 0.65 lbs/sq.in/ft. Initial Sat. 100 % Oil.
▽ 1.29 " " " " " " 100 % "
○ 2.58 " " " " " " 100 % "
□ 0.65 " " " " " " 53.5 % " 42.0 % Water 4.5 % Air
⌀ 1.29 " " " " " " 50 % " 40 % " 10 % "
⊖ 2.58 " " " " " " 51.6 % " 41.0 % " 7.4 % "

* Data by R. J. Day, Air-Gas Drive Research Program, The Pennsylvania State College.

plied to the core the oil production took a decided increase. This slug of water being added to the core reduced the residual oil saturation approximately 13 percent with a comparatively small volume of air being used for the drive. It may be added at this time that prior to being injected into the core, the air used during this drive was passed through water to insure complete saturation and thus reduce evaporation of water from the core.

After production had again tapered off to an economic limit, point "B" was reached on the curves of Figures 8 and 9. Here another slug of distilled water was added to the core. The same pressure differential of 20 centimeters of mercury was used to force the water into the sand. This water injected was 19 percent of the pore volume of the core, which amounts to a total water saturation of approximately 38 percent. The core was again allowed to remain for a time while the water distributed itself.

Similarly, after due time the core was again given a 20 centimeter of mercury air-drive. Approximately 10 percent more oil was produced, which amounts to approximately a 25 percent oil saturation of the core. It might be added at this time that during all this air driving only a trace of water had arrived at the producing end of the core. Thus the water production up to this time could be considered negligible.

The end of the last run corresponds to point "C" on the curves of Figures 8 and 9, which is at approximately 25 percent oil saturation, 38 percent water saturation, and 36.5 percent air. An additional 15 percent slug of water was added to the core, making a 53 percent water saturation, and a 20 centimeters of mercury air drive was repeated. Only a trace more of oil could be produced while approximately 10 percent of the pore volume of water was produced. This left a residual oil saturation of about 25 percent which, when compared with the 50 percent residual oil saturation of an air drive on a sand containing no water (see Figures 8 and 9), shows a 50 percent decrease in residual oil saturations. This amounts to approximately 25 percent more oil produced by the addition of water to the core between air drives.

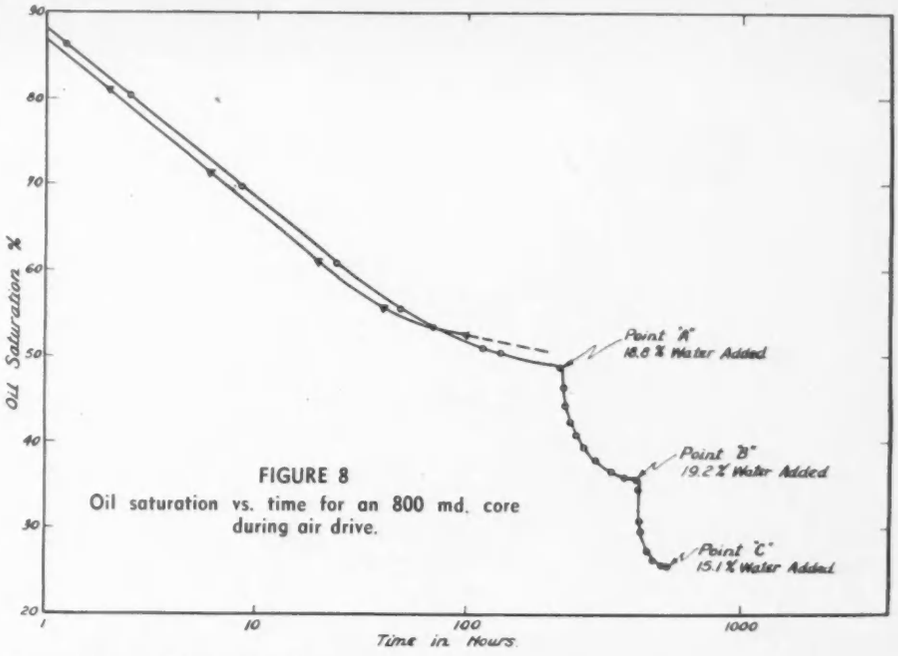


FIGURE 8
Oil saturation vs. time for an 800 md. core during air drive.

▼ ΔP = 20 cm. Hg.
○ ΔP = 20 cm. Hg. with H_2O added at points A, B, & C.

From Figure 9 it can be seen that the amount of gas after water is injected, which is required to give the first 13 percent increase in recovery, that is, to move from point "A" on the curve to point "B," was approximately the same volume as to move from 100 percent oil saturation to point "A." Approximately the same amount of gas was required to move from point "B" on the curve to point "C." This is not considered an excessive volume required for such an increase in production.

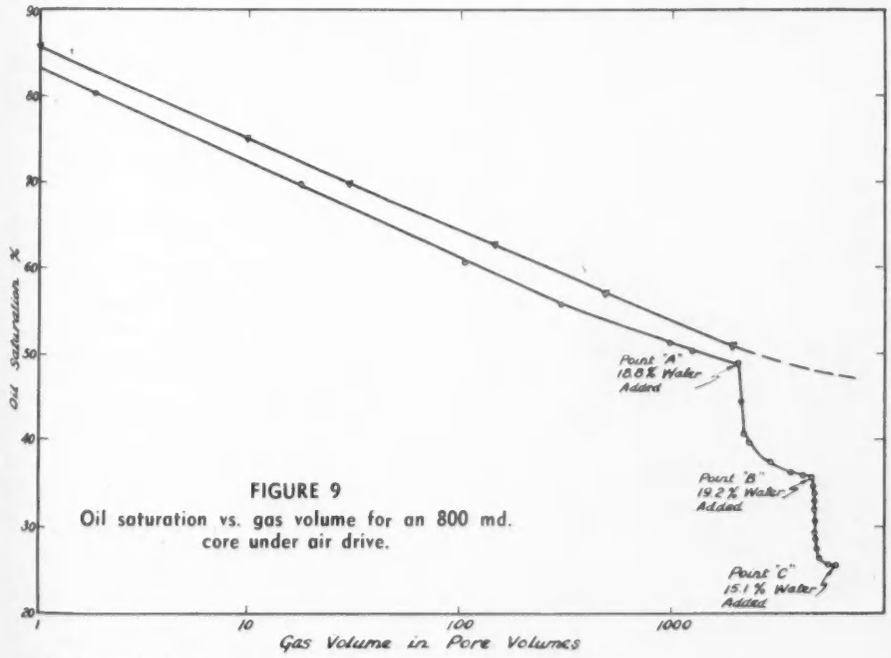


FIGURE 9
Oil saturation vs. gas volume for an 800 md. core under air drive.

▲ ΔP = 20 cm. Hg.
○ ΔP = 20 cm. Hg. with H_2O added at points A, B & C.

Time Curve

From Figure 8 it is apparent that about one-third of the total time of the drive was required to arrive at point "A" from the 100 percent oil saturated point, also one-third to go from "A" to "B" and one-third to drive from "B" to "C." This time curve does not include the time between air-drives during which the water was being given a chance to distribute itself. The overall time required for this additional production is not unfavorable.

It must be remembered that these experiments were performed on only one core, which was 100 percent oil saturated with a close-cut oil. These exact conditions would not be met in the field, but from all indications the work could be carried out on a field where the original oil saturation is relatively high and the amount of connate water is low.

It appears from this experiment that under certain conditions during an air drive it may be advantageous from a production standpoint to introduce water into the formation as an aid in reducing residual oil saturations.

Acknowledgment

The writers wish to acknowledge the helpful discussions of this work with the staff members of the Division of Petroleum and Natural Gas Engineering at The Pennsylvania State College. This work was supported in part by the Pennsylvania Grade Crude Oil Association.

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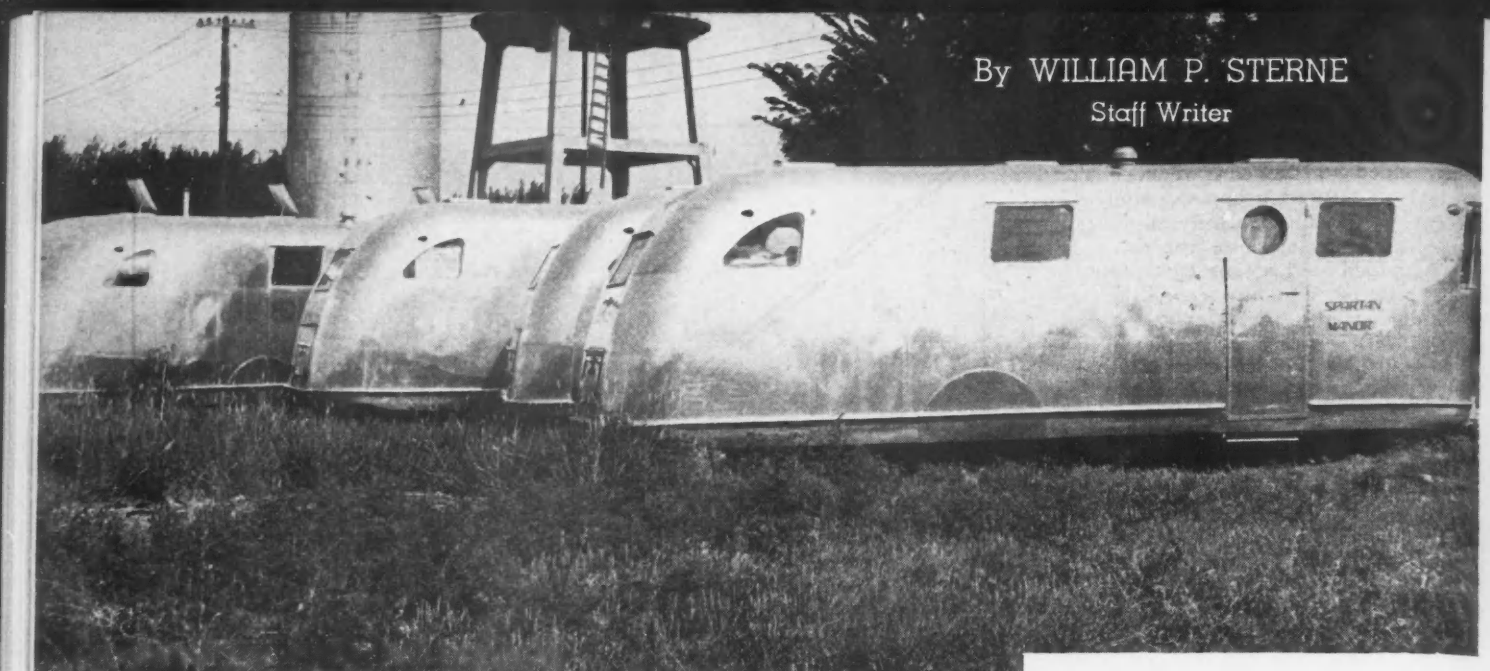


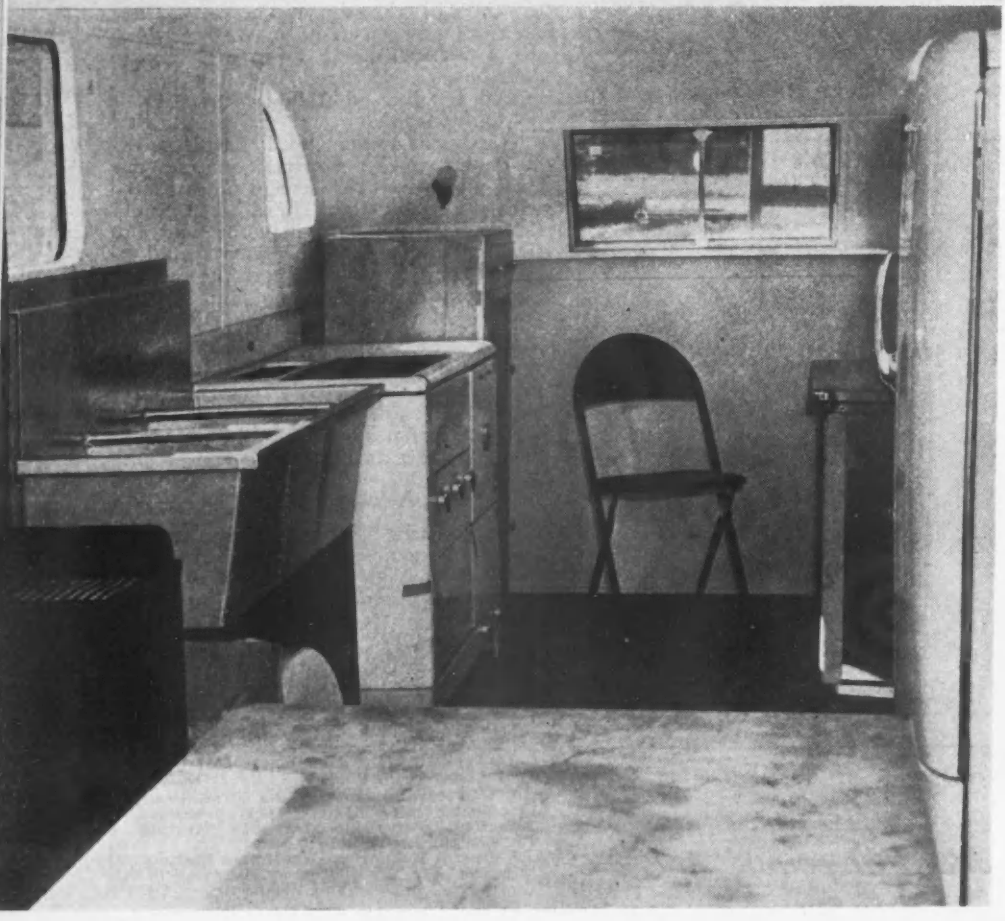
By WILLIAM P. STERNE
Staff Writer

TRAVELING TOWNS

Solve Seismo Crew's Housing Problems

Deluxe trailers are shown lined up before starting from a field location to a new area.

Trailer interior shows cooking facilities, including heating stove, sink, cooking stove, and refrigerator. Cooking trailer carries enough food to supply whole town for more than a week.



THE current housing shortage has no effect upon members of seismograph and gravity meter crews of The Carter Oil Company, which has erased the difficulties of finding shelter for its men in crowded areas by providing "traveling towns."

These towns are made up of several modern house trailers, in which the equipment has been altered to fit the needs of the respective crews. A "city" composed of several trailers which move from one area to another in convoy fashion is equipped with its own water supply, electricity, health facilities, plumbing and heating as well as a trailer to serve as office space and to carry geophysical equipment.

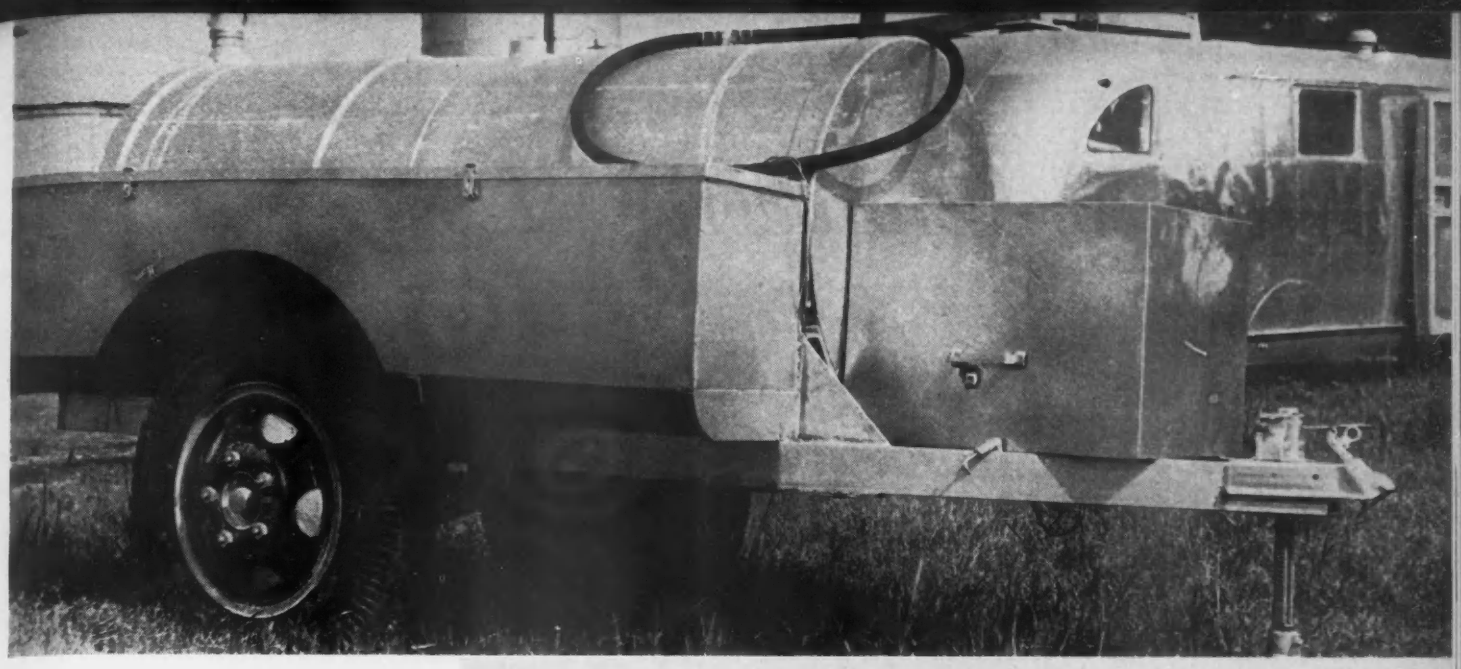
The company has calculated that the trailer towns are more than paying off. Not only do they furnish the conveniences of home to the men and solve various problems relative to their billeting, but the setup has served as a great help in keeping up the men's morale while in the field. The company now operates two of the towns, which it refers to as "Carterville, U. S. A."

These tent-and-trailer cities, which carry their own groceries and other necessary commodities, were the idea of six Carter employes: R. C. Clark, Northwest division geophysical supervisor; G. E. Schultis, R. M. Davis, C. O. Smith, party chiefs, and J. I. Walton and C. W. Bruns of Tulsa. More than four months were required to get the communities together, and to revamp the trailers for the particular use with which they were required.

The idea has resulted in three distinct advantages over the system generally used by some companies. It saves wear and tear on members of the crews who have had to drive from 30 to 75 miles daily to and from their work area; it speeds up the exploratory program generally; and it preserves delicate and expensive equipment.

Members of the crew for several years have had to make these hard drives daily, usually over backwoods and almost impassable roads. In fact often when the Carter rolling towns set up on a location, there are virtually no existing roads in the immediate area.

Meals are furnished to the crew at no cost and the cooking trailer, equipped with electric refrigeration, carries a good supply of food.



This 400-gallon tank keeps the traveling towns well supplied with fresh water. It is loaded by electrical pump in nearest city and hauled into the field along with rest of trailers making up the community.

One of the best points in the new system is that seismograph and gravity meter crew members have to spend only a four-day week afield and can spend three days weekly with their families. The men live four days each week in their own mobile trailer. They work ten hours daily for four days, with no lost motion in driving to and from work. When the 40-hour week is up they drive to the nearest town, where their families are housed. Monday mornings the men drive back to the traveling town.

Trailers are of aluminum composition with sturdy riveted airplane construction. They are 23 feet long, 7½ feet wide and a little more than six feet high. Each trailer has three double bunks to house six men. An efficient kerosine heater with electric blower furnishes heat, while vents in the trailer's top serve as a cooling system. Each bunk is 6 feet, 3 inches long and is furnished with a reading lamp. The men are each furnished with plenty of towels, bedding and other necessities.

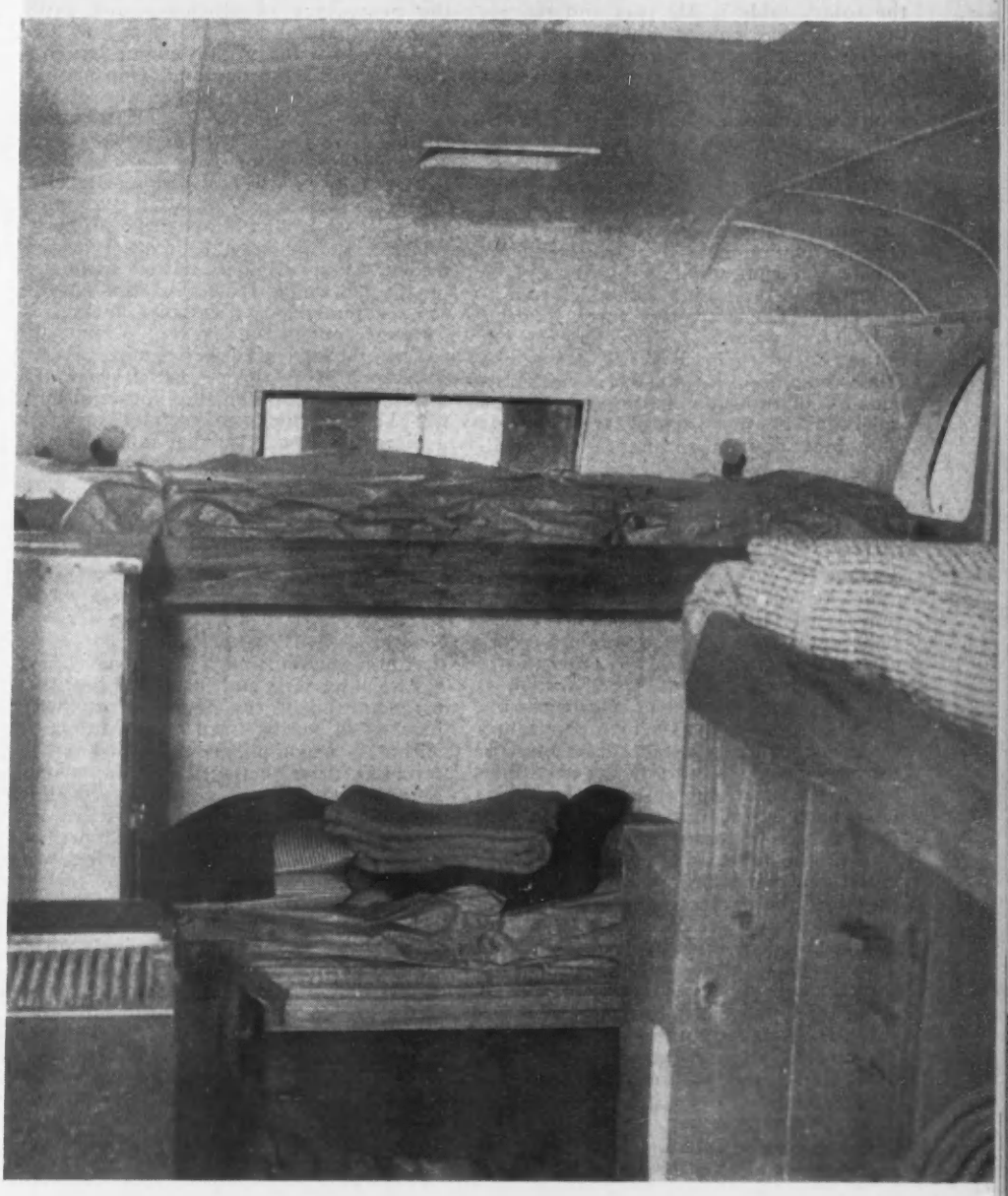
In each town one trailer is equipped with a desk and serves as the crew chief's office. Space for filing papers and making out reports is provided in this trailer, and if necessary the party chief can be busy at his office, working late into the night under a private desk lamp, while four or more other members of the crew can be resting in the same trailer.

The kitchen trailer is equipped with electric refrigeration, sinks and a cook stove. An electric generator, attached to the kitchen trailer, provides power for the lighting of the other trailers, and for refrigeration.

The special water truck holds 400 gallons of water. A gasoline pump is attached and is used to store water in the tank from the source of supply, in the nearest town. An electrical pressure system has been established to force the water into the trailer's water system, to provide water at the faucets and in the shower baths.

Crew members carry three regulation Army tents and set them up on the site of the traveling town. These tents are 16 feet square and crew can sleep in them when the weather is too hot for trailer bunking. In the northwestern portion of the country, however, where most Carter geophysical and gravity meter crews work, winds are so strong that inside sleeping is the general rule.

Typical bunk installation in trailers. Each unit sleeps six men comfortably.



Torque-Converter Drives

FOR OIL WELL DRILLING RIGS

Part 2

By CHARLES M. O'LEARY

GEAR ratios for use in connection with torque converters should be sufficient in number to permit all operations to be kept within the 80 percent efficiency range. In some instances overdrive must be used in order to keep the converter loaded to remain within the peak efficiency range when light loads are being handled. For example, in a rotary-table drive having an engine which delivers 1000 foot pounds of torque at 1000 rpm and a torque on the drill pipe of 3000 foot pounds, if the speed at which it is desired to rotate the rotary table is 233 rpm and the reduction in the rotary table is three-to-one and the transmission is in a ratio of one-to-one, at 70 percent ratio of output speed to input speed, the torque multiplication of the converter is one-to-one, or 1000 foot pounds of torque output.

The mathematics is as follows: 70 percent of 1000 rpm equals 700 rpm output speed of the converter times one (the reduction in the transmission) equals 700 rpm, divided by three (the reduction in the table) equals 233 rpm of the table. The converter torque output is 1000 foot pounds at 70 percent ratio of output speed to input speed, times one (the reduction in the transmission), equals 1000 foot pounds times three (the reduction in the rotary table) equals 3000 foot pounds torque on the drill pipe.

If a one-to-two overdrive is used in the transmission, the torque load on the converter is calculated as follows: 3000 foot pounds (the torque on the pipe) divided by three (the reduction in the table drive) equals 1000 foot pounds, times two (the overdrive ratio) equals 2000 foot pounds torque load on the converter. This falls at 38 percent ratio of output speed to input speed which is 380 rpm output speed of the converter. To find the speed at which the rotary table is now driven, take 380 rpm (the torque converter output speed) times two (the speed increase to the table) which equals 760 rpm, divided by three (the reduction to the table) equals 253 rpm of the table. However, the desired speed on the table was 233 rpm, and therefore the engine input speed may be reduced to produce 233 rpm on the table and 3000 foot pounds torque on the pipe. This reduction of input speed, i.e., torque, will move the ratio of output speed to input speed to a new point on the curve, namely the one which will produce 233 rpm on the rotary table and 3000 foot pounds torque on the pipe. The reduction of engine speed will be approximately 5 percent.

If the torque load on the pipe should increase for any reason, the speed of the rotary table will reduce. To compensate for this the throttle may be advanced to maintain the table speed at 233 rpm under the new torque loading. This is called riding the engine torque curve. By this means it is possible to ride the torque converter curve as well as the engine torque curve, and thus obtain a broader flexibility of the power at hand. This applies to rotary-table drives which should be operated on the manual control of the transmission.

A torque converter efficiency indicator has been developed which shows the percentage of efficiency and ratio of output speed to input speed of the torque converter at all engine speeds. This torque efficiency indicator should be provided for the lead engine of the power train. When drilling, this engine should drive the rotary table.

The transmission may be manually shifted with the aid of the torque efficiency indicator, or it may be automatically shifted, at least three properly selected speeds should be used in the transmission, whether shifted manually or automatically. However, four speeds are recommended to get maximum performance out of the rig.

The torque efficiency indicator referred to is a device which operates differentially between the input and output shafts of the converter and shows in a direct reading on a dial indicator the engine speed, the torque converter efficiency, the rotary table speed, the drum torque, and the torque on the drill pipe at all engine speeds. It also indicates drum speed and drum torque at all speed ratios of the transmission at every engine speed.

Automatic Shifting

Automatic shifting is being developed for hoisting pipe and for controlling the torque output to the slush pumps. Pump drives will be discussed later. Automatic sifting is accomplished by using a differential drive between the input and output shafts of the converter. Shifting of the gears occurs at a time when the converter begins to leave the 80-percent efficiency (i.e. horsepower) range on either the front or back side of the curve. After the first shift is made, the transmission, which still is in the development stage, shifts progressively up or down as the torque load on the converter dictates, to keep the converter always loaded in the 80-percent efficiency range, and selecting automatically the proper gear ratio for the driller.

The only control needed is a throttle control. The transmission will shift automatically to the highest possible speed for any given load at any throttle setting. Automatic shifting may be disconnected and manual control used if desired. The transmission can be shifted under full torque load. It is of the planetary type where are gears are in mesh at all times and consists of two planetary units in series, which give three speeds to the drum and three speeds to the rotary table. There is no synchronizing of clutches or bands as required in certain hydraulic automatic types of automobile drives. It is strictly an oil field transmission of rugged design for 1200 horsepower input and high torque capacity for use with torque converters.

In Figure 6, the solid line curve shows the performance of an automatically shifted transmission in combination with a torque converter, this performance being with an engine which peaks its torque at 600 rpm as in the curve shown in Figure 5. The dotted line curve represents the performance with an engine that peaks its torque at 1000 rpm as in the curve shown in Figure 4 (THE OIL WEEKLY, April 21). The shaded areas between the two curves indicates the increase in line speed or hook speed to be expected with the rising-type of torque curve. Two engines would double the speed shown.

Table 3 is based on the engine torque curve shown in Figure 4 which peaks its torque at 1000 rpm. By comparing the torque converter drive data shown in Table 3 with the direct drive data shown in Table 2, it will be noted that in any gear ratio of the direct driven rig and at the engine speeds of 600 and 800 rpm, a torque can be found in the 80-percent efficiency range of the converter drive which will produce more drum speed for the same torque. Comparison should be made also between Table 3 and Table 1, which will give actual pounds difference at any ratio of speeds.

Cooling of the torque converter fluid is a very important consideration. Excessive heat indicates operation on either the front or the back side of the efficiency curve below the 80 percent efficiency range; lack of sufficient gear ratios; improper selection of gear ratios; improperly matched engine and torque curve to the converter; using the converter as a brake; or that it is operating at stall of the output shaft of the converter for too long a period of time without sufficient cooling means.

The temperature of the converter fluid affects torque converter performance. A converter may be over-cooled as well as under-cooled. The higher the operating temperature of the fluid the more efficient is its operation. There is, however, a danger point at which the fluid begins to gasify. As this starts, the efficiency of the converter drops, and, if continued

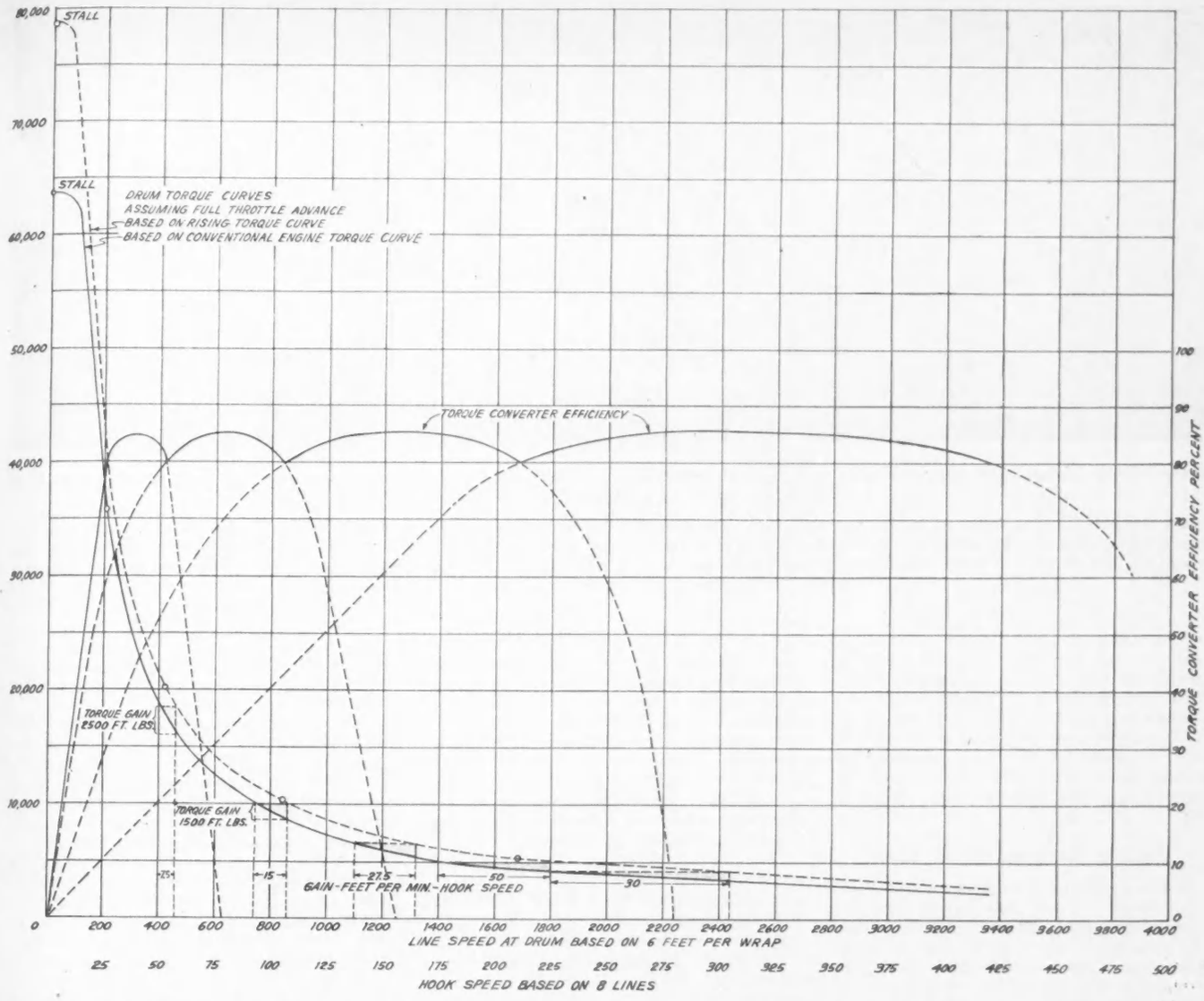

STALL
STALL
DRUM TORQUE CURVES
ASSUMING FULL THROTTLE ADVANCE
BASED ON RISING TORQUE CURVE
BASED ON CONVENTIONAL ENGINE TORQUE CURVE
TORQUE CONVERTER EFFICIENCY
TORQUE GAIN 2500 FT. LBS.
TORQUE GAIN 1500 FT. LBS.
GAIN-FEET PER MIN.-HOOK SPEED
LINE SPEED AT DRUM BASED ON 6 FEET PER WRAP
HOOK SPEED BASED ON 8 LINES
TORQUE CONVERTER EFFICIENCY PERCENT

Figure 6. Curves showing results of using ideal number of gears, together with the efficiency performance of the converter due to proper loading and automatic shifting. Solid line curve shows drum torque of an automatically shifted transmission in combination with a torque converter and driven by an engine which peaks its torque at 600 rpm. Dotted line curve represents performance with an engine which peaks its torque at 1000 rpm. Shaded areas between the two curves indicate the increase in line or hook speed to be expected with the rising type of torque curve.

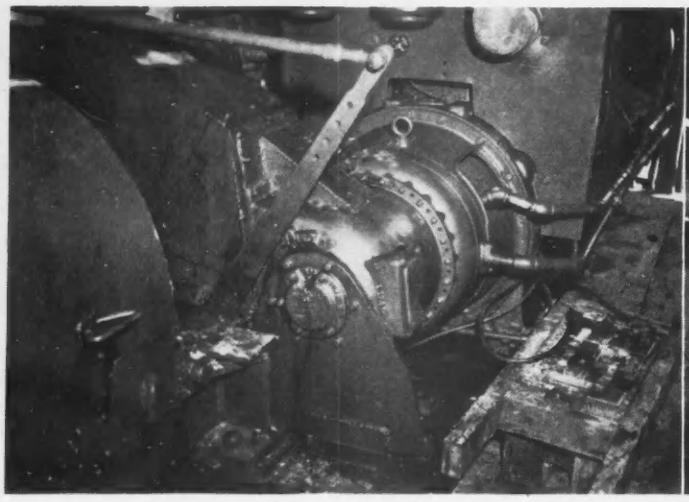
long enough, gasification will cause the drive to stop completely, as a torque converter will not run on gas or on a liquid with too high a gas content. Figure 7 shows closeup of converter and usual arrangement of fluid cooling lines.

Torque converters normally come equipped with a radiator capable of cooling 30 percent of the maximum horsepower of the engine, which is sufficient if proper gear ratios are provided in the power train. Under normal hoisting operations, however, more recently, converters have come equipped to cool 60 percent of the stall horsepower of the engine. The cooling radiators for the converters are at present installed in front of the engine radiator (Figure 8), and the engine cooling fan is used to cool the converter fluid as well as the engine cooling fluid without increasing the size of the fan. This reduces the effectiveness of the engine radiator by restricting the flow of air, and by passing air through the engine radiator that already has absorbed heat from the converter radiator, it reduces the cooling effect, causing the engine to run hot and reduce its horsepower output. This fact has been recognized by torque converter manufacturers and they now have pilot models under test with independent cooling radiators. Figure 9 illustrates one type of independently cooled radiator as designed and built by an operator drilling in California. In the models under test by converter manufacturers, the cooling fan for the radiator is driven from the input shaft to the converter. The fan is driven at engine speed, and, regardless of the amount of heat generated by the converter, it draws a constant horsepower and torque, which reduces the horsepower and torque output of the converter.

If a variable-pitch cooling fan were used, and the pitch of the blades controlled by the temperature of the converter fluid, the exact amount of power required to cool the converter fluid would be used, instead of imposing a constant horsepower draw on the engine. However, torque is lost in driving the cooling fan in both cases, and in addition, the converter cannot be properly cooled with the above system when used as a brake.

A cooling system has been developed, however, which cools automatically, uses the minimum of horsepower with no loss of torque to the converter, and which is capable of cooling the converter when used as a brake. This is accomplished by taking off a drive from the input shaft of the converter and driving into one side of a differential in a right-hand direction, and a drive from the output shaft of the converter driving to the other side of the differential with an idler gear in the system to reverse the drive into the differential to left-hand rotation. At stall of the converter, the fan derives all of its horsepower from the engine. The reaction torque of the fan is imparted to the output shaft of the converter to assist in applying torque to the load. As the output shaft of the converter increases its speed the fan speed automatically decreases and requires only that horsepower which is necessary to cool the converter. It will follow the heat curve of the converter.

When the converter is used as a brake, the cooling fan derives its power from the falling load and is driven at high speed, which is not possible by any other means. Operators are finding that torque converters make a very good brake; that they can hold the pipe suspended with the converter; that they can take a strain on the pipe and hold it; and that the pipe may be spudded by throttle manipulation. All this generates



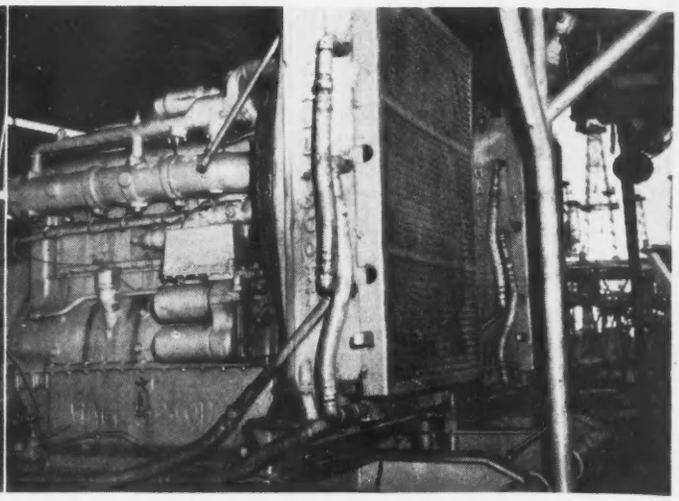


Figure 7 (left). Typical installation of a well-known make of hydraulic torque converter. Note fluid cooling lines extending on up toward engine front where cooling radiator is installed in front of engine radiator.

Figure 8 (right). Cooling radiators for the converter fluid commonly are installed in front of the engine radiator. The two fluid lines at lower left come from the high and low pressure ports on the converter. This type of cooling installation reduces effectiveness of the engine radiator by restricting flow of air. The air which is drawn through by the fan has reduced cooling effect since it already has absorbed heat from the converter radiator, thus causing the engine to run hot and with lowered efficiency.

heat in the converter considerably in excess of the cooling capacity of the radiator and cooling fan provided by the manufacturers. If the converter is used as a weight control on the bit, or to hold a strain on the pipe, the cooling system must be capable of cooling 100 percent of the engine horsepower at stall.

Braking Reverses Fluid Flow

If the converter or converters be used as a brake, about 300 percent engine horsepower cooling must be provided. The rate of descent of the pipe and the time within which the load is to be brought to a stop, determine the amount of heat that must be dissipated. A torque converter is being developed in sizes ranging from 250 to 500 horsepower, which may be used as a brake as well as for hoisting.

When the converter is being used as a brake, another problem is presented, as it is a use for which the present converters were not designed. In running the pipe into the hole at fast rates of speed, the output member of the converter is driven backwards by the weight of the falling load, and acts as a pump which reverses the circulation of fluid in the converter. Its efficiency as a pump is very low. Means must be provided to withdraw fluid from the converter, as what was normally the high-pressure outlet has now become a low-pressure area caused by the reverse flow of fluid in the converter. A second fluid outlet is provided in the converter case opposite the new high-pressure area. Also, when the turbine is acting as a pump the outlet requires an area greater than that of the normal fluid outlet due to the inefficiency of the turbine while operating as a pump and due to its lower developed fluid pressure and greater horsepower absorption when used as a brake.

The braking power of a torque converter is controlled by the engine speed. When it is desired to stop the load the engine throttle is advanced. This causes the fluid to flow again in the normal direction. At full engine speed the engine torque is multiplied by the converter to five times engine torque. This causes the turbine to stall and hold the load without the use of the manual brake. When converters are used in this manner the normal fluid outlet must be larger due to the high horsepower absorption of the converter, namely the input horsepower, to stop the load which is added to the horsepower developed by the falling load.

Torque converters, to be used successfully as a brake, should be of heavier construction than those previously manufactured. When the converter is used as a brake the transmission should not be in low gear but preferably in second or third gear, as the speed of the reverse rotation of the converter is the drum speed times the reduction in the transmission gear selected, times the reduction from the transmission to the drum. If this is to be practiced on drilling rigs, a heavy construction should be used with adequate and properly placed fluid outlets and sufficient cooling provided.

A system also has been developed recently using the torque converter as a weight control on the bit. A power train is provided which bypasses the regular hoisting transmission and which is used to drive the rotary table during drilling operations. This bypass also serves as low gear to the drum in hoisting. One of the regular engines and converters used in hoisting drives around the transmission to the bypass and powers the drum. The driller engages the necessary clutches, then opens up the engine throttle until the single engine and its torque converter begin to pick up the pipe. He then cuts the engine throttle back until he has the desired amount of weight on the bit and the throttle is left set in this position.

As the bit makes hole the pipe feeds off and maintans a constant weight on the bit. If the pipe is feeding fast through soft formation and the bit hits a hard formation, the inertia of the pipe will build up the bit pressure momentarily. The converter will retrieve the pipe just enough to maintain the bit pressure at the set weight. This is all automatic in the converter itself and requires no additional equipment except the bypass around the transmission, and proper cooling system.

A large engine should be employed for this purpose, preferably one of the engines used for hoisting. The reason for this is that if a small engine were used, its torque output to the converter would be small and a large reduction to the drum would have to be used to support the weight of the drill pipe, and on fast rates of penetration by the bit, the reverse rotation of the output turbine would be too high for the small size converter.

If it is not desirable to use one engine for the weight control and another to drive the rotary table, a system has been developed so that one engine may be employed and its output torque split, which is very satisfactory and also gives automatic torque control on the bit.

Drilling rig operators are showing keen interest in "automatic" drilling and many new developments in automatic weight control on the bit and automatic torque control of the pipe are on the drawing boards of rig manufacturers.

Many attempts have been made to develop automatic drilling rigs with varying degrees of success. These drives were like the rear drive of an automobile, the drilling engine driving into the differential in the same manner as in an automobile engine. Instead of having wheels on the output sides of the differential, sprockets were used, one sprocket driving the rotary table and the other to the jackshaft of the drawworks. The geared ratio between the drum and the differential had to be sufficient that the reaction torque of the differential times the geared ratio would balance the weight of the drill pipe less the amount of weight to be carried on the bit.

Calculations

An example of this was as follows: If the string of drill pipe weighed 200,000 pounds and it was desired to carry 20,000 pounds on the bit, the weight on the hook was 200,000 pounds minus 20,000 pounds (the weight on

the bit) which equaled 180,000 pounds; and with eight lines to the hook; 180,000 pounds divided by eight lines equaled 22,500 pounds single line pull. If the drum radius were one foot, it would reduce the torque on the drum to 22,500 foot pounds which would be necessary to support the 180,000 pounds on the hook.

If the torque necessary to rotate the drill pipe were 10,000 foot pounds and the reduction in the rotary table were three-to-one, 10,000 pounds divided by three (the reduction in the table), would equal 3333 foot pounds torque on the input shaft of the rotary table. Then, if the ratio between the rotary table input shaft and the output side of the differential to the table were one-to-one, the output shaft of the differential that drove to the jackshaft of the drawworks would also have 3333 foot pounds of torque reaction.

To determine the geared ratio to the drum in order to produce 22,500 foot pounds of torque at the drum, divided 22,500 by 3333, which equals 6.75, the geared multiplication between the differential and the drum necessary to develop 22,500 foot pounds at the drum. The latter, multiplied by eight lines, equals 180,000 foot pounds at the hook and 20,000 pounds on the bit.

One of the limitations to a straight differential drive was that if there was not a ratio in the drawworks that produced a torque multiplication of 6.75 to 1, the driller could not carry 20,000 pounds on the bit. If the driller changed the speed of the rotary table, the weight on the bit changed and there was no positive control of the weight beyond the fixed ratios in the drawworks and the speed at which the table was driven, and which might not fit the conditions existing at the time.

Another limitation was the extreme sensitivity of the drive. As is well known, table torque fluctuates many times per minute from zero torque to 100 percent overload. If the table torque increased 10 percent, the table torque would increase from 10,000 to 11,000 foot pounds; divided by three (the reduction in the rotary table) equals 3666 foot pounds reaction; times 6.75 (the reduction to the drum) equals 24,746 foot pounds to the drum single line pull; times eight lines which equals 197,968 foot pounds applied to the hook and which reduces the weight on the bit to 2032 pounds.

It now can be seen that a straight differential drive is very sensitive, is subject to "hunting," and is limited in the weight that can be carried on the bit. In spite of these shortcomings many of these drives were used and produced good results. They drilled more feet of hole per day, drilled a straighter hole, the bit lasted longer, etc., in comparison with other rigs, but due to this "hunting" and their limited degree of control, they won the disfavor of the drillers.

The new automatic drilling system overcomes the shortcomings of the older automatic rigs. The new system gives the driller complete control and he may select any table speed and any weight he may desire on the bit at all times. Also, he may control the sensitivity of the torque control on the drill pipe. By this method a driller is free to observe the action of the rig and by simply turning dial controls he may increase or decrease the weight on the bit, change table speed or increase or decrease the sensitivity of the table-drive

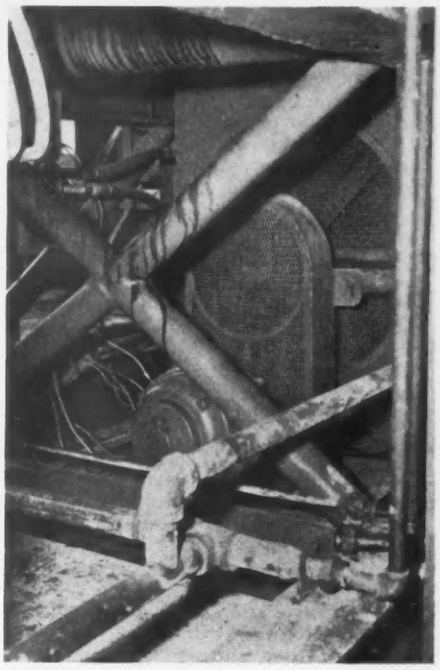


Figure 9. Independent cooling radiators powered with separate power source generally give more satisfactory cooling service. The unit pictured above, designed and built by a major operator, has been used successfully. Mounted beneath the derrick floor, the unit occupies otherwise wasted space and utilizes cooler air drawn from beneath the rig. The propeller is V-Belt driven and is powered with an electric motor. Some torque converter manufacturers recently have been experimenting with, and presently are starting to introduce, independently-cooled radiators.

reaction which controls the torque on the drill pipe. It is believed that in this manner drilling efficiency of the rig can be materially increased. The driller is free to watch the rig perform rather than perform with it, which increases his as well as the rig's efficiency.

The new system involves the use of torque converters and employs three or four engines on the hoist. The first engine drives the rotary table through a planetary transmission similar to that used in some automobiles. A reactionary drive is taken from one of the planetary units which drives a fluid motor. The fluid from this motor drives a variable displacement motor. The torque output of this variable displacement motor may be set infinitely from 0 to 8 times input torque by dial control. It drives to the drum and, by itself, acts as a straight differential drive to the drum, except that it has an infinite control between the differential and the drum and a wider selection of weight control on the bit is possible, which is a vast improvement over earlier drives.

However, in this new system the drive between the variable displacement pump and the drum is a one-to-two overdrive which reduces the reduction to the drum from the variable displacement pump from eight-to-one down to four-to-one. It is no longer possible for the differential drive to support a great portion of the weight of the drill pipe. A second force must be introduced to balance that portion of the weight not desired to be carried on the bit. This second force is developed by the No. 2 engine, which drives into a torque converter. Its flow of power bypasses the transmission through a jackshaft and drive to the drum. The throttle on engine No. 2 is advanced (assuming the rotary table is already in motion and the reaction torque is applied to the drum) until the output torque of the converter at stall of its output shaft just balances that portion of the weight of the drill pipe not desired to be carried on the bit. This factor of weight support remains fixed and the table reaction torque is the only factor that changes with increase or decrease of table torque. If the driller wishes to increase the table speed, he advances the throttle of engine No. 1. This will produce an increase in torque which reduces the weight on the bit. If the driller wishes to have the weight on the bit the same as it was before the engine speed-up, he merely cuts back on the throttle of engine No. 2 until the weight is as desired. If the sensitivity of the torque control is too high he may cut back on the torque output of the variable displacement motor and advance the throttle on engine No. 2 to get the desired weight on the bit and torque protection on the pipe. In this method all factors are under control of the driller at all times.

Example of Drive

An example of this drive is as follows: If the weight of the pipe is 200,000 pounds, eight lines are strung and 20,000 pounds is the weight to be carried on the bit, 180,000 pounds must be supported on the hook. The 180,000 pounds divided by eight lines equals 22,500 foot pounds single line pull. If the driller balances 80 percent of the weight of the drill pipe with engine No. 2, its torque converter would balance 80 percent of this weight, or 18,000 foot pounds single line pull at the drum, assuming the drum radius to be one foot. This leaves 4500 foot pounds to be balanced by the table reaction drive. If the table torque is 10,000 foot pounds, the reduction in the table is three-to-one or 3333 foot pounds. The reduction between the output reaction side of the differential and the drum must be 4500 divided by 3333 which equals 1.32 reduction in the variable hydraulic drive between the differential and the drum to produce 4500 foot pounds reaction torque to the drum.

The 18,000 foot pounds developed by the balancing engine, times eight lines equals 144,000 foot pounds at the hook; 4500 foot pounds reaction torque times eight lines equals 36,000 foot pounds, plus 144,000 foot pounds, equals 180,000 foot pounds applied to the hook and 20,000 pounds on the bit.

Now, if the table torque increases 100 percent the drill pipe torque becomes 20,000 foot pounds instead of 10,000 foot pounds.

The 20,000 foot pounds divided by three (the reduction in the table) equals 6666 foot pounds torque output of the differential table drive, times 1.32 (the reduction in the drive to the drum) equals 9000 pounds; times eight lines equals 72,000 pounds at the hook; and 18,000 foot pounds times eight lines equals 144,000 foot pounds; plus the 72,000 foot pounds at the hook equals 216,000 pounds. In this instance a 100 percent torque increase would cause the pipe to rise off bottom while in the instance of a straight differential, a 12 percent torque increase would cause the pipe to rise off the bottom, i.e., "hunt."

However, in a drilling rig where sensitivity of torque control is reduced, the bit will never rise off bottom unless the pipe begins to stick. Its only function is to continuously straighten the pipe in the hole when the pipe torques up due to side hole drag. Much of the weight shown to be on the bit by the weight indicator is in reality absorbed by the side walls. When this condition exists there is excessive abrasion on the pipe by the side walls. This condition also causes the well bore to be enlarged opposite soft formations, which results in reduced fluid velocity in these zones and in many instances is responsible for stuck pipe and a general increase in pump pressure. This condition also allows the pipe to corkscrew in the hole which increases pump pressure to put the fluid around these curves.

Automatic torque control also eliminates key seating and crystallization of the pipe. Reversals of stress in drill pipe are a big factor in the corrosion of drill pipe. The flow of static electricity along the inner and outer surfaces of the drill pipe, in combination with the chemical composition, such as salt, in well drilling fluids, promotes electrolysis. In West Texas, where so much of this type of trouble is encountered, a great deal is yet to be learned about this subject.

When the torque sensitivity control is used the driller can start drilling and set any of the variables to his liking, making changes from time to time while drilling without shutting down. He is not required to start under any set conditions. He makes his own conditions, then observes results. If they do not produce the desired results he changes them to the desired operating conditions, all of which greatly increases the efficiency of the driller. In addition, the rig drills a straighter hole, makes more feet of hole per hour, yields longer bit life and requires fewer round trips. Drill pipe life also is extended and assurance against twistoffs is provided. This may be had in combination with a weight indicator and the efficiency indicator which gives table speed, drill pipe torque, etc. As described in this article, this new system gives the driller all the desired information he needs in direct readings to produce the best results.

Pump Compounding

A great deal of work is being done on the problem of compounding two gas engine driven pumps. One method being tested is the use of a large spherical surge chamber, the chamber being divided into halves. Separating these halves is a neoprene diaphragm, the lower side of which is exposed to the rotary mud, the other side being under pressure from a nitrogen bottle. This system has met with some success.

Another system under development is to compound two power pumps from one source of power. The source of power may be one, two or three engines feeding into a two-speed differential. In operation, one side of the differential drives to the pick-up pump, and the other side of the differential drives to the pump being compounded. If the pump being compounded should slow down from an increase in output pressure, it would cause more power to flow to the pickup pump due to the increase of reaction torque caused by the increase in pump pressure of the compounded pump. In this manner the power fluctuates from pump to pump to conmpensate for the power requirements of each pump and balances the power input to the pumps. Thus, two power pumps are compounded and operate in the same manner as two steam pumps that are compounded.

The liners in the pumps may be of the same size or of different sizes. Two pumps may be driven in parallel and a third pump may be driven from the two-speed differential, the latter of which may be a standby pump. Also, a wash-down pump for the rig may be driven from the differential.

The two-speed pump-drive transmission acts in two capacities, one of which is to give a broader efficiency range to the pumps from the converter. This control is automatic.

The maximum delivered torque from the converter to the pumps may be controlled and set to shift back the transmission from two-to-one to one-to-one. In order to prevent stall torque of the converter from being delivered to the pumps in low gear when the set maximum torque is exceeded, a transmission of the two-speed planetary type with automatic torque unloading is being developed for rotary-table drives to protect the pipe against twistoffs.

A torque unloader is being developed to cut back automatically the engine throttle when the torque output of the converter exceeds a predetermined point. This prevents excessive loads being imposed on the lines and derrick. The control is independent of the throttle control at the driller's position and as the load picks up, the throttle is automatically advanced until it comes back to the original position set by the driller. The driller may cut back his throttle to any point he desires, at any time, independent of the automatic control, but he cannot override the automatic control. This action serves as the safety valve for the rig.

Much of the subject matter of this article is covered by patents or patents pending. However, torque converter use in this country is in its infancy and great strides will be made in the development of new and useful applications of torque converters. They have opened a new, broad field for development and will bring new companies into the field of oil well equipment, and add to the great fund of engineering talent that is working to improve oil production methods.

TABLE 3

Tabulated data showing performance of an engine with ideal torque curve and which peaks its torque at 1000 rpm (Figure 4), driving into torque converter and four-speed transmission.

				80 PERCENT EFFICIENCY RANGE OF CONVERTER										
	Stall -0-	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
Output to Input Speed Ratio														
Torque Multiplication Factor of Torque Converter	5.21	3.404	2.97	2.68	2.42	2.17	1.90	1.73	1.53	1.34	1.16	.92	.68	.49
Engine Torque Divided by 2	625	625	625	625	625	625	625	625	625	625	625	625	625	625
Output Torque of Converter	3,256	2,127	1,856	1,675	1,512	1,351	1,187	1,081	956	837	725	575	425	307
Reduction between Converter and Transmission 2 to 1	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2
Input Torque to Transmission	6,512	4,255	3,713	3,350	3,025	2,713	2,375	2,163	1,913	1,675	1,450	1,150	850	615
Low Gear Transmission 4 to 1	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4	x 4
Output Torque of Transmission	26,050	17,020	14,852	13,400	12,100	10,815	9,500	8,650	7,650	6,700	5,800	4,600	3,400	2,460
Reduction to Drum 3 to 1	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3
Single Line Pull: Drum R=12"	78,150	51,060	44,556	40,200	36,300	32,550	28,500	25,950	22,950	20,100	17,400	13,800	10,200	7,380
Drum Speed, RPM	0	16	20.6	25	29.2	33.3	37	41	45.6	50	54	58	62	66
SECOND GEAR:														
Input Torque to Transmission	6,512	4,255	3,713	3,350	3,025	2,713	2,375	2,163	1,913	1,675	1,450	1,150	850	615
Second Gear Transmission 2 to 1	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2	x 2
Output Torque of Transmission	13,025	8,510	7,426	6,700	6,050	5,426	4,750	4,326	3,826	3,350	2,900	2,300	1,700	1,230
Reduction to Drum 3 to 1	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3
Single Line Pull: Drum R=12"	39,075	25,530	22,278	20,100	18,150	16,278	14,250	12,978	11,478	10,050	8,700	6,900	5,100	3,690
Drum Speed, RPM	0	32	41.2	50	58.4	66.6	74	82	91.2	100	108	116	124	132
THIRD GEAR:														
Input Torque to Transmission	6,512	4,255	3,713	3,350	3,025	2,713	2,375	2,163	1,913	1,675	1,450	1,150	850	615
Third Gear Transmission 1 to 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1	x 1
Output Torque of Transmission	6,512	4,255	3,713	3,350	3,025	2,713	2,375	2,163	1,913	1,675	1,450	1,150	850	615
Reduction to Drum 3 to 1	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3
Single Line Pull: Drum R=12"	19,536	12,765	11,139	10,050	9,075	8,139	7,125	6,489	5,739	5,025	4,350	3,450	2,250	1,845
Drum Speed, RPM	0	64	82.4	100	116.8	133.2	148	164	182.4	200	216	232	248	264
HIGH GEAR:														
Input Torque to Transmission	6,512	4,255	3,713	3,350	3,025	2,713	2,375	2,163	1,913	1,675	1,450	1,150	850	615
High Gear Transmission 1 to 2 (over-drive)	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5	x .5
Output Torque Transmission	3,256	2,127	1,856	1,675	1,512	1,356	1,187	1,081	956	837	725	575	425	307
Reduction to Drum 3 to 1	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3	x 3
Single Line Pull: Drum R=12"	9,768	6,381	5,568	5,025	4,536	4,068	3,561	3,243	2,868	2,511	2,175	1,725	1,275	921
Drum Speed, RPM	0	128	164.8	200	233.6	266.4	296	328	364.8	400	432	464	496	528

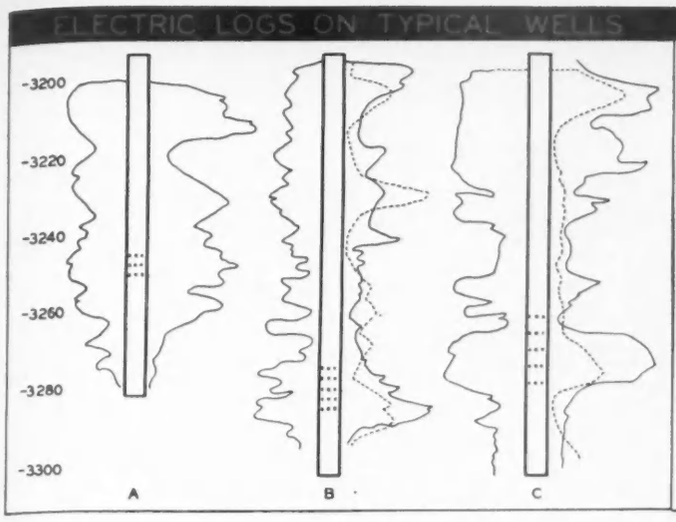


FIGURE 1

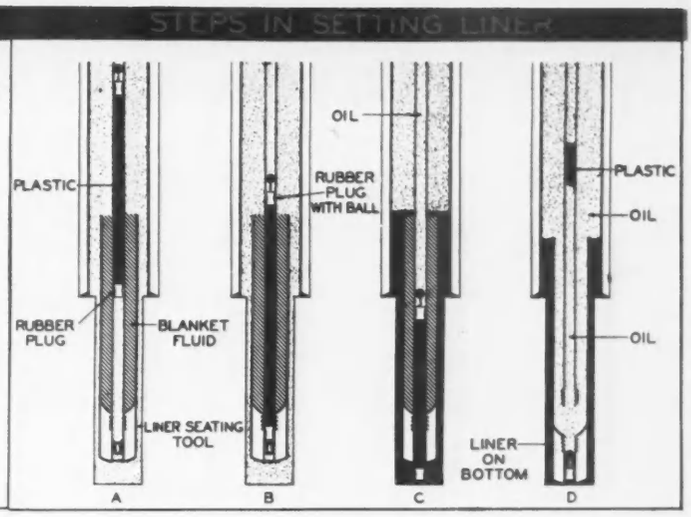


FIGURE 2

TOP WATER CONTROL
In East Texas

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EMPLOYING plastics to control bottom water in the East Texas Field has been described in previous papers[1, 2, 3, 4]. However, the experience gained from the treatment of approximately 1650 oil wells in this field, as well as the study of production data from wells with formation packers set to isolate upper sections of the Woodbine sand, indicate that complex water encroachment patterns are being formed in higher levels of the formation.

There is evidence of top or intermediate water migration in localized areas of the Pru, Cordova and Cadena surveys and the I. Ruddle, Woolam and M. Pineda surveys, although the migration has not been defined clearly in these latter areas due to limited geological and production data.

Problems associated with the exclusion of top and intermediate water can be illustrated best by briefly reviewing geological conditions and initial well completion practices in the field. The electric logs shown in Figure 1 illustrate the complex shale sections found in the so-called fairway of the East Texas field. Wells A, B and C in the illustration are spaced approximately 500 feet apart on an east-west line. Inspection of the three electric logs reveals that it would be difficult to correlate sand and shale sections, even over this short linear distance. Geological data also indicate that there are few, if any, continuous shale sections extending from the fairway to the west edge of the field. There are, however, many localized shale breaks which effect impermeable barriers, isolating great quantities of oil in lower zones.

Perforation data on the wells considered in Figure 1 show water-free production from sands below a subsea depth of —3240 feet. Well "A" shows water in the same sand section.

During the early development program in East Texas it was general practice to set casing on top of the sand and complete the wells in the top 10 to 20 feet of sand. This completion practice resulted from the thought that the Woodbine sand was continuous and homogeneous. Had this sand and shale continuity existed, wells completed in the top sections could recover oil successfully from the lower zones of the reservoir, as the water drive migrates from west to east. However, with the maximum withdrawal being taken from the top sections and the existence of localized shale streaks, water now is migrating through highly permeable zones near the top of the sand.

In order to locate these upper water sources many methods currently are being employed. These include the use of electric logs, water locator logs, core records, and drill-stem tests. Due to the difficulty of locating thin oil-bearing zones which frequently are intermediates to highly permeable water zones, it is important to obtain all the information possible before intelligent remedial recommendations can be formulated.

Since most of the wells originally were completed in the upper Woodbine sand it becomes necessary to deepen these wells to a subsea depth of approximately —3315 feet in order to explore all possible productive zones in the formation. Many methods are being employed for these deepening operations, such as those which involve cable and rotary tools and reverse drilling with oil.

The difficulty of setting short strings of pipe or liners for the purpose of isolating productive oil zones from those zones carrying undesirable fluids long has been recognized by the oil industry. As a result there have been many tools and techniques developed to achieve the desired results without the necessity of setting pipe, most of these involving the use of cement. While cement usually is effective, the high-surface pressures usually required in its application can limit its use, especially where defective casing strings or other structural defects are encountered.

The use of plastics for solving water encroachment problems offers several distinct advantages,[5, 6] among which are low surface pressures during application, large time safety factor in the event of tool or mechanical failure and the tendency of the set plastic to resist fracture as a result of jarring with tools or gun perforation.

This particular tendency allows perforating of a plastic-set liner close to the water zone where such action is desirable. In this regard the following case history is of interest:

Electric log data indicated two sands separated by two feet of shale. The lower sand appeared to be tight with a high concentration of ash and the upper sand appeared clean and highly permeable. A liner then was set with plastic and the

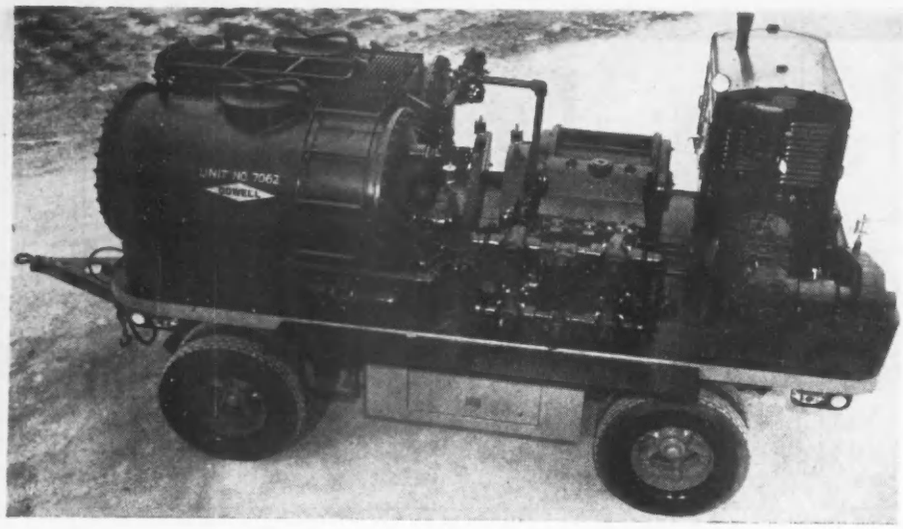

FIGURE 3

This trailer may be hauled to the well and positioned ready to place plastic when conditioning work permits. The unit consists of power plant, high-pressure pumps, and tanks for carrying liquid plastic.

lower zone perforated with six shots per foot. The well was swabbed dry, with fluid level tests indicating no entry of fluid during 24 hours. The upper zone then was perforated with eight shots per foot and the well swabbed in and making ten barrels per hour.

The plastic materials are true fluids which are capable of forming impervious solids their setting time controlled by various catalysts. Once set, the plastic forms a tight bond to the formation and to the pipe surfaces. Laboratory tests show that a pressure in excess of 4500 pounds per square inch is necessary to shear the set plastic from a one-inch by one-inch nipple. Yet, the set plastic is easily drillable where necessary.

Controlling Penetration

In many applications it is necessary also to control penetration of the plastic into the formation, this being accomplished through the use of various fillers. Much laboratory work has resulted in a penetration control as fine as one-half inch in a 70-darcy sand, while field results indicate conclusively that uniform penetration is attained with such plastics over entire sections of the Woodbine formation.

Close control of penetration and wide spread of setting time available in the plastics are particularly important in liner setting work. While the plastic setting time generally recommended for liner operations is eight to ten hours, anywhere from two to 30 hours spread is obtainable at the bottom-hole temperatures usually encountered in East Texas. As an example, due to a mechanical failure after the plastic had been spotted and the tubing had been backed out of the set shoe and pulled from the well, it was found necessary to "fish" the liner from the hole. This was accomplished successfully, following which the liner was rerun and again set with plastic.

In order to illustrate better the use of plastics for the purpose of controlling top water intrusion, the following case history is of interest: The well in this instance was equipped with seven-inch outside diameter casing and two-inch tubing, the casing set in the Austin chalk at 3190 feet, with the bottom of the open hole at 3220 feet. It had been producing excessive amounts of salt water and, being in the top water area of the Cordova Survey, it was decided to deepen the well by reverse drilling with oil to a subsea depth of 3315 feet. This additional hole was made with a 6¼-inch rock bit, using 180 feet of 3½-inch drill pipe on bottom, subbed to two-inch tubing on top.

Accurate formation samples caught during the deepening operation indicated a fine grained oil sand at —3295 to —3305 feet. Fresh water then was spotted on bottom and an electric log was run, indicating a clean oil sand from —3298 to —3310 feet. On the basis of this information it was decided to isolate the productive zone from —3298 to —3310 feet from the water zones immediately above by setting a five-inch O. D. liner. The amount of open hole called for the setting of 175 feet of liner which, in turn, would require 160 gallons of filler plastic (equal to the annulus volume behind the liner plus one gallon per linear foot of sand exposed, for penetration.)

Technique of Application

The necessary tools and the technique of the plastic application for a job of this type are shown in Figure 2. The liner set shoe is constructed from drillable material which is adapted to any size liner, with left-hand backoff threads which connect it to the tubing string. There is a 1¼-inch tapered choke assembly inside the tool which allows the passage of two-inch rubber tubing plugs. When 2½-inch tubing is used, the choke I. D. is 1⅝-inch.

The expansion joint facilitates releasing the tubing string from the liner shoe. The first rubber plug accomplishes the function of separating the plastic from the displacing fluid during the time it is being pumped through the tubing string, while the second plug accomplishes the dual function of separating the plastic and displacing fluid during pumping and of acting as a back pressure valve when pumped through the choke assembly in the liner shoe. The blanket fluid, in this case calcium chloride solution, serves to prevent excess plastic which is pumped around the top of the liner from spilling over into the liner, as shown in part C of Figure 2. The equipment which is used to introduce the plastic into the tubing consists of a mobile unit equipped with a high pressure pump and suitable mixing tanks, similar to that shown in Figure 3.

Position of Tools

Referring again to Figure 2, Part A illustrates the relative position of all tools used for setting a liner with plastic. When the liquid plastic has reached the choke assembly in the liner shoe, as shown in Part B of Figure 2, the pumping rate is reduced to a minimum. The resulting reduction in displacement volume allows gravitational separation to occur at the plastic-oil interface, thus eliminating as nearly as possible all channels back of the liner. Part C of Figure 2 illustrates the squeeze technique employed. The plastic is spotted by volume measurement, usually not requiring that back pressure be held on the casing other than that of the fluid head. After the ball which is attached to the second plug has landed in the set shoe, the tubing is rotated to the right, disengaging the tubing from the liner. After backing off the tubing, as shown in Part D, any excess plastic which may be present is reverse circulated from the well. Following the placing of the plastic, it is customary to allow 16 hours before the liner is perforated.

To date there have been more than 90 deepening jobs in East Texas for the purpose of uncovering lower Woodbine production. Of this total, 25 liners have been set with plastic. Practically all have been successful. Considering structural and other type failures on those jobs not employing plastic the average cost per job is lower for the plastic-set liners.

COMING SOON
"Meteorological Engineering and the Oil Industry"
by
C. C. Bates
and
A. H. Glenn
WATCH FOR IT!

References

[1] J. E. Bailey and C. E. Dimit: Plastic Plugbacks in East Texas, The Oil and Gas Journal, October 28, 1943, pages 52-53.

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MORE OIL AT LESS COST THROUGH

Selective Shooting

By F. R. COZZENS

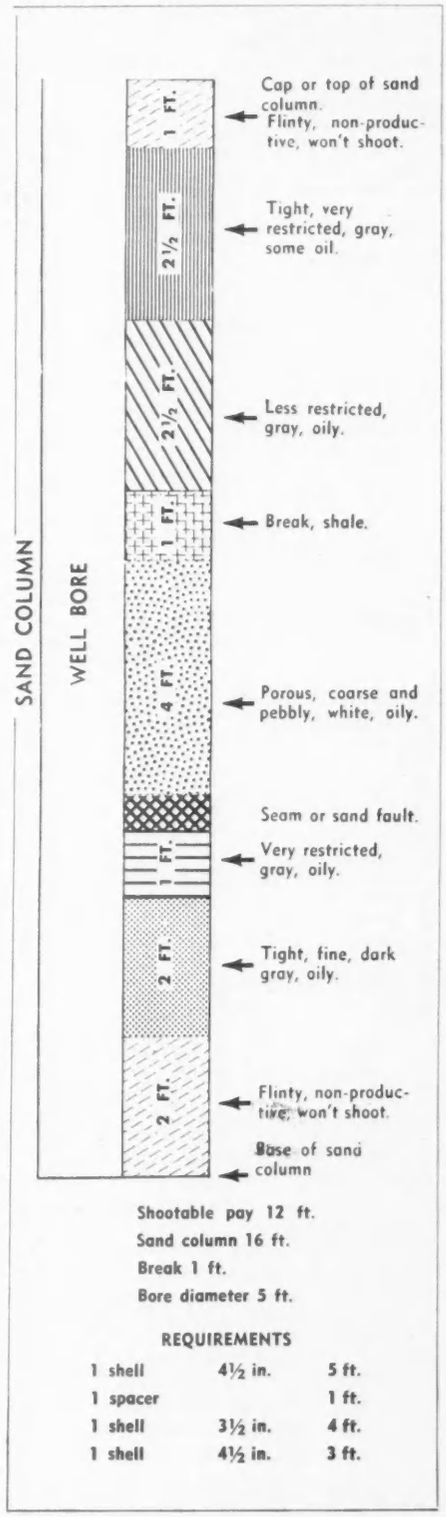
THE co-originator of the "Marietta Process" of oil recovery by air-drive, I. L. Dunn, was also much of an authority on well conditioning, and was among the first operators in the eastern fields to practice the principles of what is now termed "selective shooting." In discussing the shooting of a well (near Chesterhill, Ohio) where spacers had been placed between nitroglycerin shells, Dunn compared the oil flow at the bottom of a well to a water system above the ground. "Pressure is usually good at the mains," he explained, "but the service you get in the house depends upon the plumbing, and how the job was carried out. Pressure is always good in a virgin sand but unless it is shot according to its nature there is likely to be a faulty plumbing system which easily gets out of order and builds up a growing resistance to incoming oil."

Back in those days, the customary practice was to shoot the entire sand-column with equal amounts of nitroglycerin—no preference being given to tight or restricted zones, and in most cases, production was immediately stepped up, anywhere from 10 to 100 percent. While initial pressure was high, those of us who grew up with the eastern oil fields gave little thought to Dunn's comparison.

Later, however, when flush production leveled off, certain pumping difficulties came into evidence and continued to multiply and grow more troublesome as wells dragged into the stripper stage. Eventually, it became necessary to abandon certain wells—not because the sand was too badly depleted, but because too much labor and expense were required to produce the oil. When other old wells were finally hooked into recovery patterns, drainage difficulties became serious problems, and now, looking back across the years, we see clearly defined, the numerous effects of faulty well "plumbing." Clearly exemplified also is the fact that shooting technique is largely responsible for a well "plumbing" job, and there is no specific formula that fits all cases because a pay sand is a complicated structure which varies in principle and which must be worked according to its nature for effective results. It therefore becomes necessary to eradicate or repair obsolete well plumbing before any secondary oil recovery measure can succeed, and the initial corrective step is a closer study of sand structure in relation to the use of explosive force.

Elastic Term

"Selective shooting" is a very elastic term, involving some technicalities which are beyond range of the average operator. This does not mean, however, that benefits are confined to a certain few. Fundamental principles of selective shooting are now in use in practically every oil-producing district, and especially good results are now being obtained in the redrilling of old fields where haphazard shooting has long predominated. The process actually begins when a well reaches the top of the pay sand. From that point on, the course of the well is logged by the foot, instead of by the screw as was formerly the case. This procedure requires considerable more drilling-in time, but it happens only once in the life of a well and short runs eliminate the possibility of passing up stretches of highly productive sand. One or two feet of overlooked pay has often meant the loss of a thousand or more barrels of oil.



The operator's record-form is generally a strip of paper upon which is penciled a rough outline of the prospective sand-column—with margins at the sides to be filled in with data relative to sand formation and structure. As drilling-in progresses, each run is marked in its respective place on the sketch (commencing at the top) along with brief, marginal notes as to sand permeability, porosity, and color. Mention is made of any breaks, faults, or seams which may occur at any point along the course. Such recordings continue until the bit has passed through the base of the sand column, after which the runs are totaled and checked for acuracy; measurement of each independent zone being computed from the actual amount of shootable (productive) sand.

The record is completed by listing in their respective margins the length of each zone and diameter of the column bore. The sketch is then turned over to a representative of the nitroglycerin company who does the shooting, along with instructions to provide shells in diameters so the charge can be distributed through the sand in proportion to its structural needs. Tight and restricted zones are shot as heavily as possible, the 4½-inch diameter shell (allowing 3.4 quarts of nitroglycerin per each foot of sand) being generally used, although a 5½-inch shell gives better results if the diameter of the sand-bore will accommodate it. In some cases, nitroglycerin is released along with the loaded shell in a very restricted zone, so as to provide additional fracturing force. Shells of smaller diameters, ranging from one inch to 3½ inches are used opposite the porous zones, and spacers are required for any breaks or faults listed on the chart. Narrow zones at the top and base of a sand column are usually non-productive and are seldom

shot. The modern well-shooter understands these conditions much better than the average oil operator, and generally can place an explosive charge within an inch or two of its specified position. If chart measurements have been recorded with a reasonable degree of accuracy, there will be little risk of not getting an effective shot.

Tamping the Charge

Of importance second only to the selective distribution of nitroglycerin is the method of tamping or stemming the charge. The majority of stripper-field operators prefer to stem with water, the formula being 10 feet of water in the hole to each quart of nitroglycerin. Equally good, or better, results are obtained by the use of solid stemming; such as road chat or sand. There is less risk of caving while the casing is out and the charge is more firmly confined, but an additional amount of time is required in cleaning out. Regardless of its nature, the stemming must have weight sufficient to confine the blast so that little or no burden is thrown out of the hole. The old-time spectacular shots which jetted burden high over the derrick were pleasing to the crew because the well practically cleaned itself. But the force and energy required for lifting out the burden could have been expended to far better advantage against the sand face.

Being of slower velocity, and much easier managed than nitroglycerin, semi-solid explosives—principally gelatin, are gaining favor, especially among operators of the shallow sand fields. Advocates believe that the lower pressure buildup exerts greater fracturing power against certain typees of sand, with less shattering than is usually the case when straight nitroglycerin is used. Gelatin charges of a specified strength are sometimes loaded in ordinary tropedo shells, but generally it is necessary to "belly-out" a cavity in the sand face so the desired quantity can be pressed in. Such cavities are established by detonating (electrically) a 4x16-inch gelatin cartridge against a selected area of sand, the spoil being removed by bailer until the desired dimensions are attained. Anywhere from 50 to 500 pounds of gelatin is thus loaded into a tight and restricted area. In the shooting of loose and open sand, gelatin cartridges are usually loaded end to end in a four-inch diameter shell to provide the explosives column. This allows approximately 6.3 pounds of gelatin to each foot of sand. Most users favor a N.G. strength of 60 to 80 percent, extra L.F. All gelatin charges are stemmed with solid material, preferably clay, and it is advisable to detonate the charge by battery, using heavily insulated copper wire and electric blasting cap, no smaller in size than a No. 8. If the operator does his own shooting, printed instructions (usually included with the pack) relative to loading, taping, attaching cap, etc., should be followed to the letter.

Selective charges of both gelatin and nitroglycerin are now being used with some degree of success in old wells where regular shooting originally was done. In this work, the operator must proceed largely by the method of trial and error because a shot hole of undetermined dimensions is already established, and the location of tight and restricted formations is mostly guesswork. It sometimes happens, however, that the original well record can be found, or enough data secured from neighboring wells to enable him to place a charge within reasonable limits of the desired area. Since the porous sand in such wells already has been shattered too severely, no explosives are placed in those areas. Instead, protective measures are taken to prevent further shattering by partly filling the shot hole with fluid (oil or salt water), allowing the fluid column to extend up with six to ten inches of the base of the shell. A solid stemming is always used above the shell, and charges are detonated by battery. In these, as in all other well-shooting cases, cleaning out should be started immediately. Many promising wells have been seriously damaged by allowing residue to remain (without agitation) in the hole for a week or more after the shooting was done. Usually, it is not necessary to remove casing or packers in selective shooting if the charges have been accurately isolated and confined, but if such is done, casing should follow the drill before any caving of the upper formations has started. The cleaning-out process should continue until several washdowns of the sand face have failed to bring in residue. Incidentally, the big majority of stripper field operators favor the use of salt water in cleaning out a newly-shot well. When salt water is not available on the job, an artificially made brine is used, being stirred up in the water barrels in proportions of 100 pounds of granular salt to each barrel of fresh water. When either salt water or brine can be utilized in connection with a well-washer, considerable labor, time and expense are taken from a cleanout job.

Since oil-bearing formations vary from well to well in structure and composition, selective shooting may be roughly described as a balancing process, the basic effort being to distribute explosive strength throughout a sand column so as to equalize drainage in each respective zone. This is accomplished by fracturing the sand according to its nature. Tight and restricted zones being least responsive to fracturing, maximum explosive force is needed against them. An equal degree of fracturing is obtained in soft, porous zones with less force, depending upon the extent of porosity. These fractures, ranging in length from a few inches to several feet into the sand from the point of blast, comprise (collectively) the well's piping or plumbing system. Through it, oil is conveyed to the well in regular pumping, and from the well, artificial force (air, gas, or water) is conveyed through the sand in secondary oil recovery for the benefit of other wells in the immediate locality. When the plumbing system is adequate and uniform, the production range is increased, and more sand scope is brought into producing areas. Oil is therefore recovered faster, and with less labor and expense.

A Progress Report

Condensate Well Corrosion Study

UNDER way for well over a year, the study of condensate well corrosion by a special committee by the National Association of Corrosion Engineers, Houston, has standardized the types and sizes of specimens of various materials to be inserted in the flow strings of these wells to determine resistance to the special, highly corrosive conditions encountered in this type of production.

Before the recent meeting of NACE in Chicago, V. V. Kendall, corrosion Engineer, National Tube Company, discussed progress in the design and standardization of the test specimens. For testing materials, two types of specimens and containers were designed to be inserted in the flow lines of condensate wells. The washer-type specimen consisted of 14 gauge mild steel plates, 1.5-inch wide by 4.4-inch long with a square hole stamped in the center to fit closely on a ⅞-inch square steel bar. These specimens were placed at right angles to each other on the bar and separated from each other and from the bar by proper insulation. The container was ten feet long and contained 129 specimens. The cylinder-type specimen fitted snugly in the pipe container so that the inside wall of the specimen was on a line with the inside wall of the gas flow-line. These specimens were cylinders two inches long of seamless tubing with an inside diameter of 1.510 inch, and separated from each other and from the pipe wall by proper insulation. This container was six feet long and contained 30 specimens.

Before proceeding with the testing of the various materials, it was deemed advisable to determine the variability due to the type of test specimen and the number of replicates of each material that should be used. Therefore, for the first trial period of 90 days, the specimens tested in each container were all of the same steel.

A statistical analysis of the resultant data was made with the following conclusions:

1. The standard error for 124 specimens in the washer test was plus or minus 17 percent of the mean. Four specimens each of 32 materials can be tested with an expected error of 8.64 percent.

2. The corrosion rate decreased from the gas inlet to the gas outlet end of the washer container, the equation for which has been calculated.

3. The standard error for 30 specimens in the cylinder test was 3.95 percent of the mean. By using blank specimens in the No. 1 and No. 2 positions, thereby removing the turbulence effect at the inlet and in the gas flow due to the flange, two specimens each of 14 materials can be tested with an expected error of 2 percent.

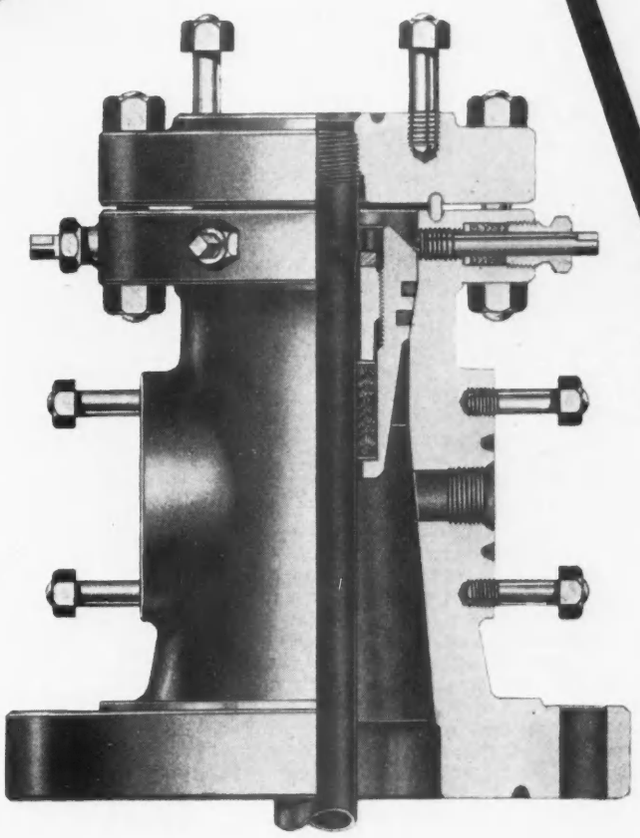
4. There is no significant change in corrosion rate from one end of the cylinder container to the other.

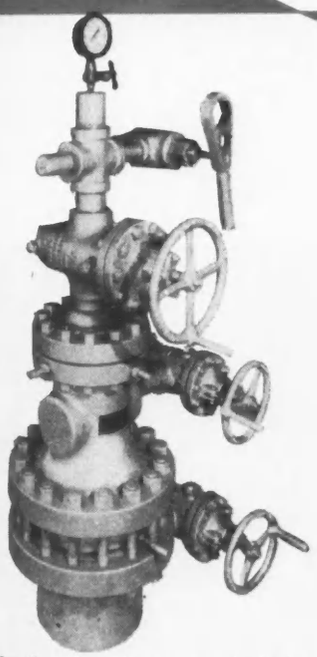
This is the new....

Cameron FORGED STEEL TUBING HEAD

FEATURING:

3 INTERCHANGEABLE TUBING HANGERS





Except for the valves, this is a completely *forged* steel Cameron Xmas Tree. It consists of a Type "F" Casing Head and Spool, Type "F" Tubing Head and Type "F" Flow Wing. The latter provides a wing valve and adjustable or positive choke in a single, compact housing.

To the proven lock screw design Cameron has added the advantages of a FORGED ALLOY STEEL housing to bring the industry a fine new tubing head in the 4000-6000 lbs. test pressure range . . . the Cameron Type "F" Tubing Head. Having thick side walls for greater structural strength and being heat treated for high tensile strength, these new heads impart a high factor of safety to the well manifold.

Three types of tubing hangers are interchangeable in the head, allowing the operator to select the type best suited for his particular well completion. The Type "FS," illustrated in the cross-section view above, is commonly known as the "polished joint" type hanger. Its use is recommended where it is desirable to wash-in the well and set a production or formation packer by manipulation of the Xmas tree. The Type "FB-A" Hanger is commonly known as the "Boll Weevil." It can be run through blowout preventers and provides a simple yet dependable means for suspending and sealing the tubing string.

The Type "FB-B" Tubing Hanger is identical in design to the Type "FB-A" except that it is threaded to receive a tubing back pressure valve which allows the operator to safely wash-in the well under blowout preventer control. The tubing back pressure valve may be removed from the hanger after the tree has been installed, utilizing a Cameron valve removal tool.

Stripper rubbers are also available and are interchangeable with the above hangers.

An illustrated pamphlet has been prepared on these revolutionary *Forged Steel* Well Heads. Send for a copy today to complete your file on well head equipment.

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Protect Drinking Water Can in Convenient Enclosure

A common problem existing on the average production service truck is that of finding a convenient place for mounting the water cooler. Installed on the truck bed, the unit is accessible, but usually takes up room much needed for materials or tools. If mounted beneath the edge of the bed it is exposed to injury by flying gravel, mud or dust. In addition, regardless of where it is located, the can generally must be lashed down or otherwise secured to its mounting, and often the can is worn at points of contact with the pipe or angle material used to enclose it. Providing a simple solution to all these problems is the method of mounting the can devised by one major company. A rectangular container, having a full-opening, piano-hinged door on the front, was mounted beneath the overhang of the truck bed at a point about two feet back of the cab.

CREW COMFORT

Designed to accommodate a particular size can, with little or no unnecessary space provided except for padding, the cabinet has a positive acting latch which may be padlocked if desired. Near the bottom of the door a circular opening was cut out through which the water can spout projects. A semi-circular shield, having a short pin welded to its upper surface, was welded over the upper portion of the opening as shown. The spout is protected from dust or other injury by a can which slips over this flanged opening and which is locked in place by means of a bayonet type slot. Suspended by a short length of chain attached to the door, the easily-removed cover cannot be misplaced or lost. The can may be taken out and replaced easily and quickly.

Hinge-Mount Vise on Truck

To prevent the vise from protruding beyond the back of the truck bed when not in use, one operator placed the vise on a hinged plate so that it would swing back inside the truck bed when the truck was in transit.

TOOL MOUNTING

Using a short piece of 12-inch pipe which was the proper diameter to fit around the back of the bolster, a piece was cut out wtih a welding torch large enough to accommodate the vise. The vise was fastened to a flat plate with the conventional three bolts, and the two plates welded together on one edge. A hinge was made of ⅜-inch pipe with a bolt fitting snugly inside, and then welded to the truck bed on either side.

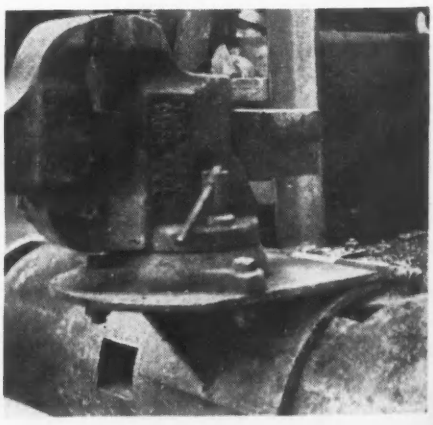
In operation, the vise is swung out for use when on the job, and when the crew is ready to return from the field, it is swung back inside the truck bed.

Add Lift to Pick-Up Truck

By rigging up a crane, one operator was able to speed up loading and unloading operations. This assembly is easily applied to pick-up trucks which operate without a power winch. The railing is made from 1¼-inch pipe which snugly fit the wells in each corner of the truck bed. The swinging beam is made from two-inch pipe, with a brace welded firmly at a 45-degree angle to insure stiffness.

LOADING DEVICES

A thrust bearing from a clutch assembly is placed on a plate set in the corner of the truck to take the weight, yet make it easy to swing the load through 180 degree arc. The end of the swinging beam is fitted with an eye bolt to take the hook of a hand-operated hoist. A short piece of chain is fastened between the end of the swinging beam and the railing to prevent the load from swinging the wrong way and damaging the side of the truck.



PENBERTHY
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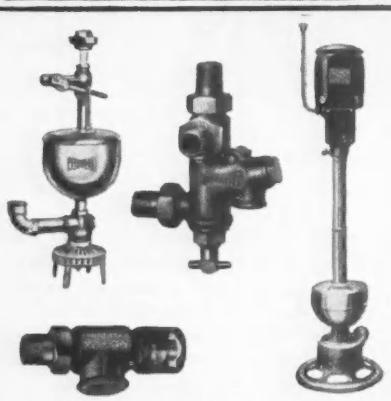

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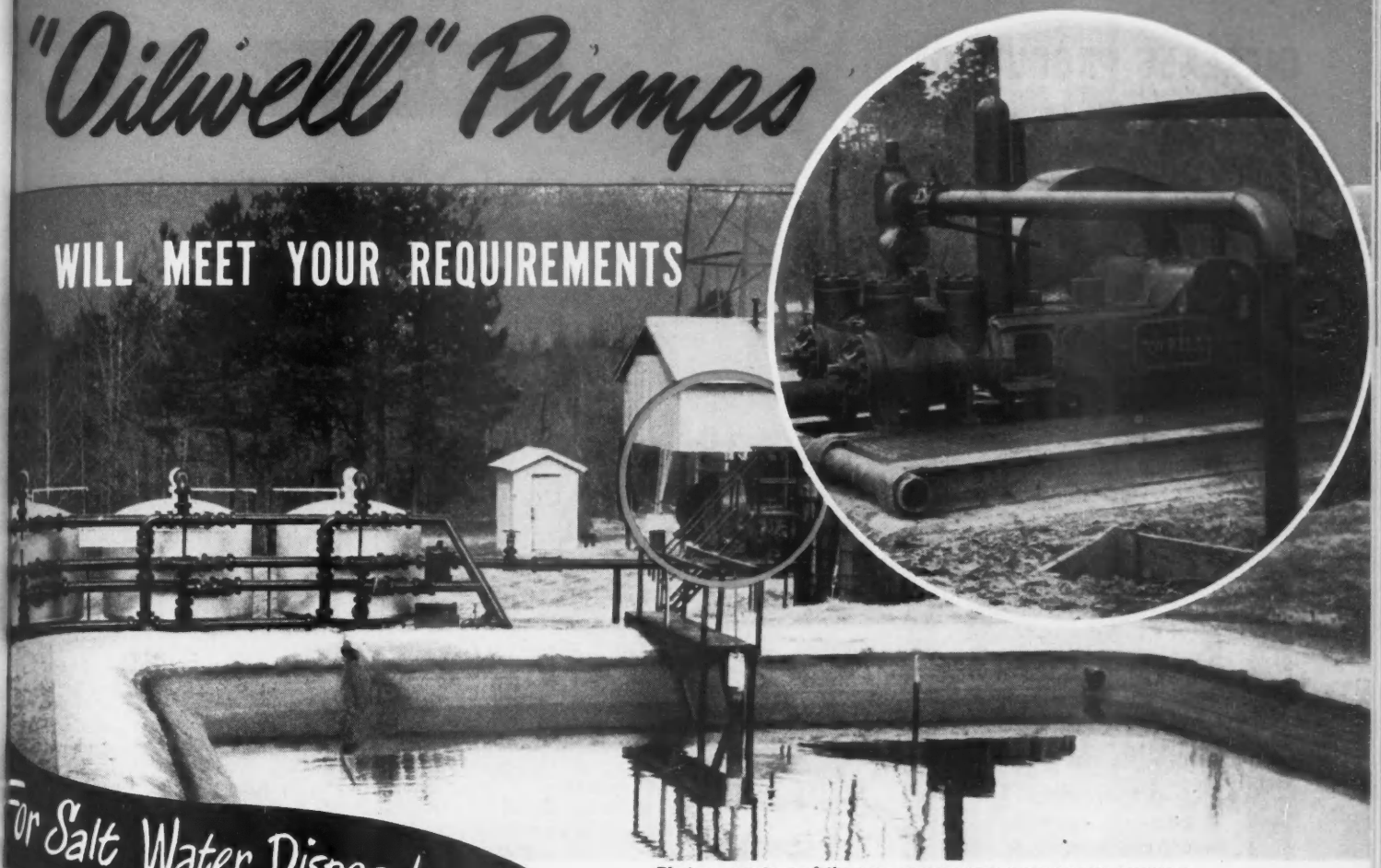

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No. 8P-HD	Di-Hard Bronze	5 only 5, 4½, 4	20–80	24–206	600–1280
No. 12-P	Di-Hard Bronze	5 only 5, 4½, 4	20–70	50–270	540–875
No. 612-P	Di-Hard Bronze	6, 5½, 5 6, 5½, 5	20–70	75–390	520–765
No. 712-P	Di-Hard Bronze	7¼, 6¾, 6, 5 7¼, 6¾, 6, 5	20–70	75–580	550–1200
No. 14P-HD	Di-Hard Bronze	7¼, 6¾ 6, 5½ 7¼, 6¾ 6, 5½	20–65	105–620	765–1375
No. 36-P	(Plunger Type) Di-Hard Aluminum-Bronze Stainless Steel Steel	(Plunger Size) 3 3, 2¾, 2½, 2¼ 3, 2¾, 2½, 2¼ 3, 2¾, 2½, 2¼	20–140	6.5–77	1420–2510

*All bronze fluid end available.

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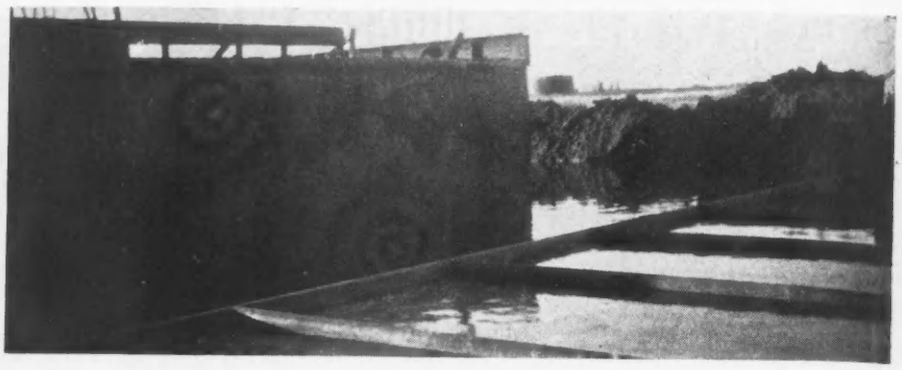


TANKS

Shortages in steel products have brought about numerous innovations throughout the industry in an effort to save as much steel as possible. One company operating in the Chase field, Kansas, was faced with the need of a large tank . . . the only one available at the time being a buried salt - water settling tank, measuring 44 feet long, 20 feet wide and 7½ feet high. The job of moving the tank from its former location to a new location about a mile distant without dismantling the tank required engineering ingenuity and skill.

Water was pumped in large volumes under the empty tank buried in the earth, thereby causing it to float from its old foundation and onto waiting skids, the latter being of welded four-inch casing. Fourteen hours were required to completely raise the tank and place it onto the fabricated skid.

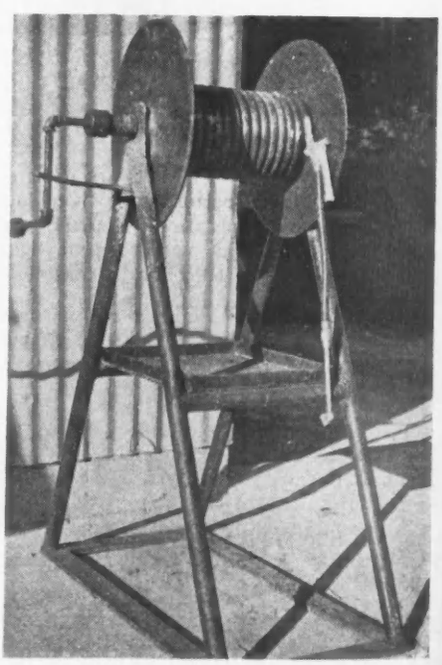
The salvaged tank, set on top the skid, was then dragged across open country by tractor and truck in tandem to its new location. The unusual moving operation resulted in a saving to the company of approximately $4000. Work and time normally required to dismantle the tank were thus eliminated, with the over-all result producing a serviceable tank which otherwise might have been abandoned because of high moving cost under regular procedures. It was the first time that such a large tank in a Mid-Continent field was moved such a distance in this manner.

Speed Truck Servicing with Home-Made Hose Rack

TRANSPORTATION

Producers and truckers are becoming more conscious of the necessity of maintaining correct air pressure in tires on their vehicles. A neat rack for the air hose can be made from salvaged material. The one shown in the photo was built up on one-inch pipe frames with strips of half inch metal for a base. The drum of the reel is constructed from a short length of 5½-inch pipe and quarter-inch sheet metal is cut in a circular shape and welded to the ends to make the sides. The shaft for the reel is made from one-inch pipe, one end blanked off, the middle connected to the air hose and the left end fitted with a packing gland made from a pipe cap.

Air under approximately 150 pounds pressure is connected to the quarter-inch line leading to the reel. In operation, the reel turns on the axles and spins on the quarter-inch pipe in the packing gland. After the tires are aired, the hose is wound on the reel by means of the crank shown on the right.



.....how much is it worth?

IN 1846, twenty three years before the Golden Spike was driven at Ogden, Utah marking the completion of the first transcontinental railway, John August Roebling built America's first truly practical, wire rope suspension bridge. This bridge, which carried traffic across the Monongahela River for scores of years, stood as a silent testimonial to his confidence in a principle of bridge building which, in that day, was looked upon with considerable misgiving.

How much is this confidence worth to bridge engineers, and to humanity as a whole, today?

Had it not been for his confidence there would have been no Brooklyn, George Washington nor Golden Gate Bridges. Had it not been for your confidence in the company that bears this pioneer's name, there could have been no John A. Roebling's Sons Company.

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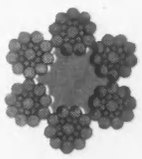
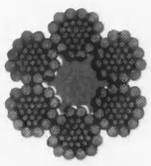
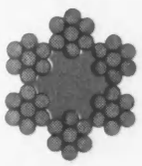


6 x 19 Haulage Rope

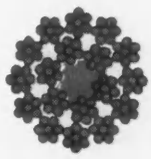
8 x 19 Extra Flexible Hoisting Rope



6 x 30 Flattened Strand Rope



6 x 7 Standard Coarse Laid Rope



18 x 7 Non-Rotating Hoisting Rope

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Completions Rate UP

AT THE end of this year's first quarter there had been 7 percent more wells completed than in last year's comparable period. This margin of increase was due largely to the stepped-up drilling rate during March when well completions topped those of March, 1946, by almost 18 percent.

This acceleration in the drilling program is taking place despite severe shortages of tubular goods. Many operators are finding it necessary to salvage and remachine, if necessary, junked tubing in order to fill their needs or to conserve new materials they have on hand. Scarcity of suitable pipe for long strings and high pressure wells is being felt now more than at any time during the war period.

There were 2528 wells of all classes completed during March, an increase of 148 over the 2380 finished in February, and 384 more than the 2144 wells in March of last year. Of March's total, 382 were exploratory wells, while the remainder were routine or field development wells. This total was comprised of 1359 oil, 26 distillate, 272 gas and 674 dry wells and the remaining 197 were service wells and old wells drilled deeper.

Well completions during the first three months of this year totaled 7172, an increase of 7.2 percent over the 6688 completed in last year's first quarter. A month earlier the total for the first two months showed an increase of only 2.6 percent over last year's comparable period. So far this year there have been 3726 oil wells, 75 distillate, 841 gas and 1949 dry wells completed. The remaining 581 wells included service wells and deepening operations on old wells.

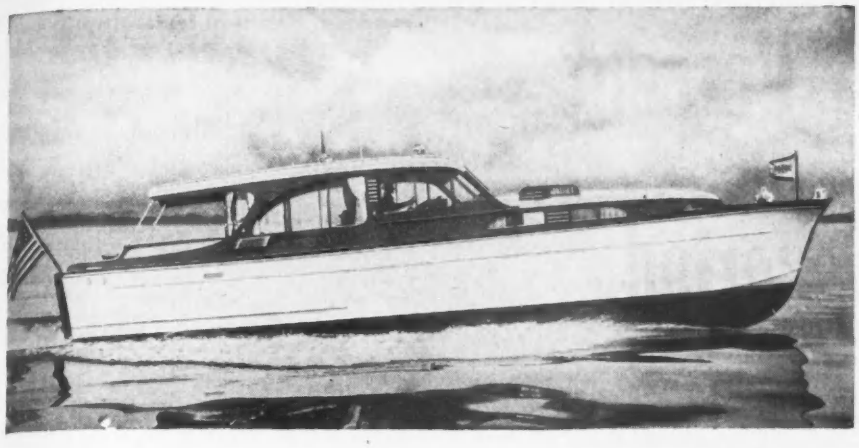
Texas' drilling records show that this year there have been 2035 wells completed against 1930 in the like period of last year, an increase of 5.4 percent. For the first two months Texas' drilling had lagged behind last year's, but during the past month it gained momentum, and at the end of the quarter it held an increase almost comparable to the nation's lead.

[5]Well Completions in the United States During March, 1947, and Cumulative for Year

(Figures compiled from weekly reports of Oil Weekly staff, with following exceptions: Illinois from Illinois Geological Survey; Indiana from Indiana Division of Geology; Missouri from Missouri Geological Survey; Tennessee from Tennessee Division of Geology; Bradford, Kane-Clarendon, and Allegany fields of Pennsylvania and New York from the Producer's Monthly.)

STATE OR DISTRICT	MONTHLY COMPLETIONS: March, 1947									Total Completions				CUMULATIVE TOTAL January-March				Rigs in Operation (Drilling, Rigging Up and Shut Down)		
	New Wells								Total Drilled Deeper											
	Oil	Dist.	Gas	Dry	Water Input	Gas Input	Water Disposal	Total New		Mar., 1947	Feb., 1947	Mar., 1946	Footage March, 1947	Wells 1947	Wells 1946	Percent Diff.	Footage, 1947	Mar. 31, 1947	Feb. 28, 1947	Mar. 31, 1946
Alabama	1							1		1	3	2	3,203	4	5	— 20.0	12,376	3	3	5
Arizona																		2	2	1
Arkansas	8	1		10				19		19	13	8	89,681	49	39	+ 25.6	212,293	34	31	30
California	136		4	36				176	2	178	155	155	721,881	482	467	+ 3.2	1,991,620	291	309	298
Colorado	14			3				17		17	11	7	104,472	37	25	+ 48.0	218,709	47	46	67
Florida				1				1		1	4	1	4,010	8	5	+ 60.0	34,307	7	6	8
Georgia				1				1		1		1	3,847	1	1		3,847		1	
Illinois	110			75				185		185	133	160	479,406	465	450	+ 3.3	1,177,505	183	229	256
Indiana	34		5	19			1	59		59	33	30	105,736	126	76	+ 65.8	223,997	71	75	77
Kansas	84		30	47			1	162	15	177	212	157	524,947	560	514	+ 8.9	1,765,214	298	327	245
Kentucky	24		17	19				60		60	54	53	108,373	170	171	— 0.6	306,774	105	100	110
Louisiana	49	7	8	30				94	1	95	93	103	612,307	298	304	— 2.0	1,887,710	149	146	178
North Louisiana	21		6	16				43	1	44	49	52	150,423	148	154	— 3.9	542,783	50	49	87
South Louisiana	28	7	2	14				51		51	44	51	461,884	150	150		1,344,927	99	97	91
Michigan	16		2	28				46		46	30	40	114,646	116	164	— 29.2	271,640	127	129	126
Mississippi	15		3	5				23		23	21	21	188,704	70	56	+ 25.0	578,578	92	70	94
Missouri											4	1		14	4	+250.0	7,924	3		9
Montana	3		1	2				6		6	3	11	18,392	18	54	— 66.7	48,828	39	37	71
Nebraska																		6	6	4
New Mexico	37		6	7				50	6	56	43	33	228,889	141	100	+ 41.0	571,161	107	110	78
New York	74		1		47			122		122	129	108	172,673	[6]359	311	+ 15.4	[6]508,934	[6]149	101	103
North Carolina				1				1		1			6,370	1			6,370		1	
Ohio	28		40	27				95		95	79	93	267,870	295	267	+ 10.5	875,679	233	232	234
Oklahoma	176		14	122				312	3	315	303	194	880,721	889	643	+ 38.3	2,643,336	515	484	448
Pennsylvania	89		47	18	72	24		250	2	252	257	296	434,209	[6]784	887	— 11.6	[6]1,364,747	[6]332	371	433
South Dakota																				7
Tennessee															1	—100.0		10	10	4
Texas	451	18	44	207	1		1	722	18	740	711	598	3,225,842	2,035	1,930	+ 5.4	8,946,510	1,120	1,134	1,074
Dist. 1 S. Central	13			8				21		21	32	14	93,204	75	32	+134.4	263,165	31	28	32
Dist. 2 Middle Gulf	40	3		18				61		61	53	[1]	392,124	153	[1]	[1]	930,309	58	43	[1]
Dist. 3 Upper Gulf	44	10	2	20				76	1	77	55	53	425,337	192	171	+ 12.3	1,231,402	84	87	72
Dist. 4 L. Gulf-S.W.	51	5	5	37				98	2	100	98	93	551,774	261	341	+ 21.4	1,431,292	112	108	163
Dist. 5 East Central	4		1	4				9		9	7	[2]	50,895	25	[2]	[2]	111,928	24	25	[2]
Dist. 6 Northeast	24		4	10			1	39		39	32	62	204,022	109	170	— 21.2	545,433	66	73	103
Dist. 7-B N. Central	25		4	26				55	1	56	73	[3]	169,201	183	[3]	[3]	559,315	115	124	[3]
Dist. 7-C W. Central	12		1	5				18		18	23	[4]	50,871	48	[4]	[4]	171,119	63	71	[4]
Dist. 8 West	116			16				132	7	139	139	128	676,204	405	407	+ 11.3	2,031,944	331	324	350
Dist. 9 North	103		1	56	1			161	7	168	165	220	444,150	462	695	— 7.2	1,265,149	141	140	295
Dist. 10 Panhandle	19		26	7				52		52	34	28	168,060	122	114	+ 7.0	405,454	95	111	99
Utah												1			2	—100.0		5	6	8
Washington																		1	1	
West Virginia	3		49	12	1			65	2	67	74	58	187,417	203	171	+ 18.7	580,817	390	380	389
Wyoming	7		1	4				12		12	15	13	59,930	47	41	+ 14.6	232,759	60	55	72
Total United States	1,359	26	272	674	121	24	3	2,479	49	2,528	2,380	2,144	8,543,526	7,172	6,688	+ 7.2	24,471,635	4,379	4,402	4,369

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8. [5] Effective with data for September, 1946, figures are on calendar month basis. Previously, all statistics were for 4-week and 5-week months, explained when published. [6] Part of Bradford Field now included in New York; formerly, all was carried in Pennsylvania.



LEFT: *Elco 47' DeLuxe Cruiser*—Sleeps six or seven. Two cabins and spacious deck house. Two lavatories, one with shower. Speed 20-22 m.p.h. A big spacious cruiser for real comfort and luxury.

BELOW: *Elco 40' DeLuxe Cruiser*—Sleeps six. Two cabins, two lavatories, shower. Speed 24-26 m.p.h. A magnificent big cruiser with superb appointments for comfortable living. Other Elco models not shown are: the 27' Sport Cruiser, the 35' Cruisette, and the 62' Motor Yacht.

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Exploration 14 Percent Above 1946 Period

RECORDS on well completions are bearing out forecasts that this year will produce a new all-time high in exploratory drilling. At the end of the first quarter, well completions of this classification numbered almost 14 percent more than those recorded in the like period of 1946, the year in which exploratory operations reached their highest level.

Recent raises in crude prices undoubtedly have had a stimulating effect upon the industry's campaign to locate new sources of oil, so necessary to offset the depletion of known reserves by the extremely high postwar demand for all oil products. Although this activity is being carried on at a high level, shortages of tubular goods are having their effects. Adequate materials for long strings and for use in high pressure areas are becoming very scarce. Many operators are searching junk yards in search of pipe that can be reconditioned in order to carry on or to save meager supplies of new material.

During the first three months of this year there were 1153 exploratory wells completed against 1013 in last year's first quarter, an increase of 13.8 percent. However, during the current period, 19.9 percent of all the wells were successful as compared with 20.7 percent productive in last year's three months. These comparisons of successful completions are strictly numerical and do not in any way reflect the quality of the results.

This year there have been 155 wells completed that have discovered new oil

Summary of Results of Exploratory Drilling

ITEM	Mar., 1947	Feb., 1947	Three Months: January-March 1947	1946	Percent Diff.
Oil Discoveries	56	47	155	115	+ 34.8
New Fields	28	29	88	75	+ 17.3
New Pays	28	18	67	40	+ 67.5
Distillate Discoveries	8	9	25	11	+127.3
New Fields	4	2	10	5	+100.0
New Pays	4	7	15	6	+150.0
Gas Discoveries	6	6	18	36	— 50.0
New Fields	3	2	11	28	— 60.7
New Pays	3	4	7	8	— 12.5
Total Discoveries	70	62	198	162	+ 22.2
Extensions to Fields	12	14	31	48	— 35.4
Oil Fields	9	11	24	32	— 25.0
Distillate Fields	1	2	4	2	+100.0
Gas Fields	2	1	3	14	— 78.6
Total Prod. Tests	82	76	229	210	+ 9.0
Dry Holes	300	289	924	803	+ 15.1
Wildcats	285	282	890	778	+ 14.4
New Pays	7	5	18	17	+ 5.9
Outposts	8	2	16	8	+100.0
Total Expl'tory Tests	382	365	1,153	1,013	+ 13.8
Percent Productive	21.5	20.8	19.9	20.7	.....
Percent Dry	78.5	79.2	80.1	79.3	.....

Results of Exploratory Drilling in March and First 3 Months, 1947-1946, by Districts

State or District	MONTH OF MARCH, 1947													FIRST THREE MONTHS, 1947																	
	Productive Tests									Total Productive	Unproductive Tests			Total Exploratory Tests	Productive Tests								Total Productive	Unproductive Tests			Total Dry		Total Exploratory Tests	
	New Fields			New Pays			Extensions								New Fields			New Pays			Extensions									
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.		Wildcats	New Pays	Outposts		Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.	3 Mo. 1947	3 Mo. 1946	Wildcats	New Pays	Outposts	3 Mo. 1947	3 Mo. 1946	3 Mo. 1947	3 Mo. 1946
Alabama																										2			2	4	2	4
Arkansas						1				1	4	1		6						1				1	1	10	1		11	8	12	9
California	1			1			2			4	29			33	1			2			2			5	10	65			65	62	70	72
Colorado											1		2	3	1									1	1	5		2	7	3	8	4
Florida											1			1												8			8	5	8	5
Georgia											1			1												1			1	1	1	1
Illinois	2			4			2			8	25			33	10			11			8			29	12	77			77	86	106	98
Indiana				4			1			5	4			9				4			1			5	3	14			14	9	19	12
Kansas	5	1								6	12			18	13	3							1	17	26	68			68	58	85	84
Kentucky	1						1			2	6			8	1						1			2	5	16			16	21	18	26
Louisiana	1		1			1				3	15	1		19	5		1	7		7	1		1	22	18	50	1		51	41	73	59
North Louisiana											8	1		9	1								1	2	4	29	1		30	25	32	29
South Louisiana	1		1			1				3	7			10	4		1	7		7	1			20	14	21			21	16	41	30
Michigan	1									1	16	1		18	1						1			2	7	47	1	1	49	53	51	60
Mississippi				1						1	3			4		1		1			2			4	2	15			15	17	19	19
Missouri																										7			7	1	7	1
Montana												1		1												3	1		4	2	4	2
New Mexico	1						1			2	5			7	2						1			3	2	13	2		15	15	18	17
New York																														1		1
North Carolina											1			1												1			1		1	
Ohio											7			7											12	14			14	12	14	24
Oklahoma	3			1						4	54			58	21	3	1	1			1			27	33	159			159	66	186	99
Pennsylvania																									2				2		2
Tennessee																													1		1
Texas	13	2	3	17	3	2	2	2	1	45	100	3	4	152	31	4	8	40	7	7	6	2	3	108	69	308	10	11	329	329	437	398
Dist. 1 S. Central	1									1	8			9	3									3	3	30			30	20	33	23
Dist. 2 Middle Gulf	3		1	1		1				6	12		2	20	3			3	3	1	2	1			13	1	31		2	33	1	46	1
Dist. 3 Upper Gulf	1	1	1	1		1	1		1	7	9		1	17	3	2	3	2	2	2	1		3	18	15	30		1	31	35	49	50
Dist. 4 L. Gulf-S.W.			1	5	3			1		10	20		1	31	4	1	2	10	4	3		1		25	14	52		3	55	61	80	75
Dist. 5 East Central											1	1		2											2	13	1	1	15	2	15	2
Dist. 6 Northeast											7			7											9	13	1		14	29	14	38
Dist. 7-B N. Central	3			5						8	10	1		19	7			11						18	3	51	3		54	3	72	3
Dist. 7-C W. Cent.	1									1	2			3	1						1			2	4	5		1	6	4	8	4
Dist. 8 West				1			1			2	8	1		11	1			6			2			9	9	25	3	3	31	49	40	58
Dist. 9 North	4	1		4						9	21			30	8	1		8			1			18	19	56	2		58	129	76	148
Dist. 10 Panhandle									1	1	2			3	1								1	2		2			2	6	4	6
Utah																									1				1		2
West Virginia																									2				3		5
Wyoming											1		2	3	2			1						3	4	7	2	2	11	4	14	8
Total U. S.	28	3	4	28	3	4	9	2	1	82	285	7	8	382	88	11	10	67	7	15	24	3	4	229	210	890	18	16	924	803	1153	1013

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8.

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pools against 115 in the same period of last year. Of these totals, 88 were new field openers against 75 last year and 67 were discoverers of new pay horizons in fields against 40 a year ago. These new pay figures are the counts of the discovery wells and are not necessarily the totals of new pays found, as several wells were credited with locating at least two new sands. Major extensions of at least ½ mile were made to 24 oil fields, while extensions were made to 32 fields in the same period a year ago.

New distillate discoveries this year number 25 to 11 last year. There are ten new fields against five, and 15 new horizons compared with six a year ago. Four distillate fields have been extended by at least ½ mile, while last year's records show only two.

Gas discoveries have been less numerous than in last year's initial quarter. This year has had 18 discoveries against 36 last year. New pay horizons were about even at seven to eight, but new fields dropped from 28 last year to 11. Gas field extensions also were down to three from last year's 14.

Out of the 1153 exploratory wells completed in this year's first quarter, 999 were strict wildcats, 86.6 percent of the total, while last year's 886 out of 1013 amounted to a slightly higher percent at 87.5. The remaining 154 and 127 wells, respectively, were semi-wildcats.

In March, exploratory drilling resulted in 382 completions, 82 of which proved productive. That was an increase over the 365 exploratory completions in February and the 324 in March of last year. March's successful wells resulted in 56 oil discoveries, 8 distillate discoveries, 6 gas finds and extensions to 12 fields.

Out of 33 exploratory tests completed in March, California netted an oil field, a new oil pay and two oil field extensions. Illinois gained 2 oil fields, 4 oil pays and 2 oil extensions from 33 tries. Eighteen completions brought Kansas five new oil fields and one gas field.

Nineteen tests accounted for an oil field, a distillate field and a new distillate pay in Louisiana, none of which appears important. Michigan found only one oil field out of 18 exploratory wells.

Oklahoma's three new oil fields and one new oil pay did not come easily and were the only results of 58 exploratory completions. The new field discovered by Ryan Oil Company in McClain County seems to be the only one of significance. Texas had an unusually good month with 45 producers out of 152 wells. Thirteen of these opened new oil fields, several of which show promise, and 17 found new oil pay strata, adding important reserves to several fields.

New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in March, 1947

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of th's Tentative Opinion).
		ARKANSAS—New Distillate Pay									
Miller	Fouke	Carter Oil's Philyaw 1, c sw se 36-16s-27w	12-15-46	3- 6-47	7505	4920-	Kilpatrick li; L Cre	F 72; 1 mln ¼"			
		CALIFORNIA—New Oil Field									
Fresno		Superior Oil Co's Hakala 55-32, 32-15s-17e		3-14-47	7171	7020- 7034		F 145; 3/4"	30.8		
		CALIFORNIA—New Oil Pay									
Kern	McDonald Anticline	Honolulu Oil Corp.-Wilshire Oil Co's Layman 1, 18-28s-20e		3-10-47	2080		Button Bed sd; Mio	F 200; 3/8"	17.8		
		CALIFORNIA—Oil Field Extensions									
Kern	Round Mtn.	Morton & Kohlbush's Alam 1, 15-28s-28e		3-11-47	2746		Vedder sd; Mio	P 168; 25 wtr	12		
Kern	Salt Creek	Independent Exploration Co's Roco 1, 18-29s-21e		3- 6-47	1913		Carneros sd; Mio	F 200; 3/32"	15.8		
		ILLINOIS—New Oil Fields									
Effingham	Bible Grove, North	Gilliam & Aspin's E. Adams 1, sw nw se 10-6n-7e, 2½ mi n of e edge Bible Grove pool.	2- 5-47	3-31-47	2878	2868- 2872	McClosky li; Miss	P 102; 30 wtr			One offset completed as producer.
Lawrence	Beman, E.	Steve Zanetis' Mahrenholz 1, 1323 fr nl, 1000 fr el, nw se 19-3n-10w, ½ mi se Beman pool.	1-25-47	3-11-47	1904	1882- 1884	McClosky li; Miss	P 190; 175 wtr			One offset completed as dry hole.
		ILLINOIS—New Oil Pays									
Clay	Stanford, W.	NationalAssociated Pet. Co's Klein 2, nw ne ne 33-3n-7e	1-14-47	3-25-47	3083	2978- 2980	Rosiclare li; Miss	P 40; 12 wtr			All prev prod fr McClosky.
Wabash	Lancaster Central	Nu-Enamel Oil Operating Co's C. F. Higgins 1, n sw ne 7-1n-13w	1-10-47	3-11-47	2815	2808- 2812	McClosky li; Miss	P 55; 6 wtr			Deepest in pl which is now producing fr 3 Ste. Genevieve pays.
Wabash	Lancaster, E.	Arvin Drilling Co's E. Alka 1, sw sw ne 35-2n-13w	2-12-47	3-18-47	2750	2662- 2667	Rosiclare li; Miss	P 150			Disc well prod fr Biehl (Penn), a'so 1 mie ext.
White	Concord Cent.	Great Lakes Carbon Corp's Calvert 1, se ne nw 4-7s-10e	1-17-47	3-18-47	3053	2899- 2970-	Aux Vases sd; Miss McClosky li; Miss	P 9; 9 wtr			Prev. prod fr Cypress. Gd Aux Vases wel' comp later in mo.
		ILLINOIS—Oil Field Extensions									
Wayne	Geff	Tuley & Carter's J. C. Stanley 1, 330 fr nl, 890 fr wl, sw 18-1s-8e, ¾ mi ext.	2-27-47	3-31-47	3107	3083-	Aux Vases sd; Miss	P 80			
Wabash	Keensburg Consol.	Illinois Mid-Continent Co's Kurtz 1, (OWWO) nw ne se 25-2s-14w, 1¼ mi w extension.	1- 3-47	3- 4-47	2874	2090- 2103	Tar Springs sd; Miss	P 15; 15 wtr			Abnd 2-25-47 and reworked to make a producer.
		INDIANA—New Oil Pays									
Gibson	Patoka, E.	J. J. Savage's Hall 2, 19-1s-10w		3- -47	1790	1772- 1785	Upr Cypress sd; Miss	P 60			
Gibson	Princeton, N.	Princeton Mining Co's Hurst 1, nw se 8-2s-10w		2- -47	1944	1926- 1936	Benoist sd; Miss	P 152			
Posey	New Harmony	Central Pipe Line Co's Pote 3, sw ne se 18-5s-13w		1- -47	1871	1836- 1865	Degonia sd; Miss	P 164			
Posey	Springfield	B. M. Heath's Stallings 1, ne sw nw 30-5s-13w		1- -47	2020	2006- 2016	Palestine sd; Miss	P 222			
		INDIANA—Oil Field Extension									
Gibson	Patoka, E.	J. J. Savage's Hall 1, se c 19-1s-10w		3- -47	1675	1662- 1672	Upr. Cypress sd; Miss	P 7			
		KANSAS—New Oil Fields									
Barton		C. E. Ash's Roth 4, cne ne 25-19s-11w, 1 mi w Silica pool		3-19-47	3325	3295- 3325	Arbuckle li; Ord	P 200		Ant; dr	Betw old abnd Lanterman and the Silica fld.
Ellis		Bennett & Roberts' Dabrinski 1, nw nw ne 16-17s-9w, 2 mi w Lorraine pl		3-12-47	3310	2906- 2980	Lansing li; Penn	P 50; 50 wtr		Ant; dr	Small pl betw Lorraine and Stoltenberg pls.
Ellis		John Lindas et al's Feitz 1, ne ne se 27-14s-19w, 1 mi w Antonio pl		3- 7-47	3721	3712- 3721	Arbuckle li; Ord	P 132		Ant; dr	
Rooks		W. L. Hartman's Rempke 1, nw nw se 21-9s-18w, 3 mi se Barry, SE pool		3-20-47	3591	3579- 3591	Arbuckle li; Ord	P 284		Ant; seis-dr	
Trego		Doley Oil Co's Moon 1, nw nw ne 20-13s-21w, 1 mi e Riga pool		3-19-47	3933	3902- 3933	Cgl; Penn	P 138		Ant; dr	No major importance.

		KANSAS—New Gas Field									
Rice		Drillers Gas Co's Lowery 1, cse sw 36-19s-9w, 3 mi e Chase pool		3-15-47	2200	2117- 2200	Tarkio li; Penn	7.1 mln		Ant; dr	
		KENTUCKY—New Oil Field									
McLean	Buck Creek	R. T. Holtzclaw's Underwood 1, 9-M-29, 1 mi nw Barrett pool		3- -47	1165	1146- 1162	Pennsylvania sd; Penn	P 22			
		KENTUCKY—Oil Field Extension									
Daviess	Owensboro	Sohio Pet Co's Simon Smith 1, 14-P-29		3- -47	1069	1058- 1065	Waltersburg sd; Miss	P 5			
		SOUTH LOUISIANA—New Oil Field									
Cameron		Magnolia's Lutcher 1-C, start nec Sect 24, go 1320 s 550 w to lcn in 24-14s-11w, 4 mi ne Mud Lake gas-cond prod.	11- 1-46	3- 9-47	11705	10762-10832	Sd; L. Miocene (?)	F 47; 3.7 mln; 7/16"	43.2		Some additional development expected.
		SOUTH LOUISIANA—New Distillate Field									
Cameron	Grand Chenier	Sohio Pet Co's Chas. Richard 1, c sw¼ sw¼, 1-15s-5w, 9 mi w sw Pecan Lake field, 8 mi se Little Chenier gas prod.	11- 9-46	3-11-47	11020	8380- 8390	Sd; L. Miocene (?)	no gge 5/32"			Unimportant.
		SOUTH LOUISIANA—New Distillate Pay									
Jeff Davis	Bon Air	Sohio Pet Co's Claudius Fontenot 4-B, sec 16-10s-6w, s offset to well 2-B on w side of prod.	12-28-46	3- 9-47	10660	10380-10396	Sd; Olig	F6; 1.2 mln; 1/8"	50.5	Flt	Unimportant
		MICHIGAN—New Oil Field									
Newaygo	Kimball Lake	Sun Oil Co's Linderer 1, sw sw sw 11-12n-13w, Garfield Twp, 15 mi sw Goodwell oil field.	1-15-47	3- 2-47	2336	2331- 2336	Traverse li-dolo; Dev	F 216; 1/8"	45.3	Ant; ed	Preliminary tests indicate promising pl
		MISSISSIPPI—New Oil Pay									
Adams	LaGrange	Texas-Pacific Coal & Oil Co's O. L. Wilson 2, swc 8-6n-2w		3-29-47	6275	4640- 4642	U. Wilcox sd; Eoc	F 216; 1/8"	44		One of shallowest Wilcox producers in State.
		NEW MEXICO—New Oil Field									
Eddy		E. Orcutt et al's F. E. Kepple 2, (OWDD) sw nw se 19-17s-27e	4- 3-46	3-31-47	1903	1710- 1815	San Andres li; Perm	P 15	35	Ant; geol	Small productive area.
		NEW MEXICO—Oil Field Extension									
Lea	Drinkard	Mid-Continent Pet. Corp's State 1, Lse. 15, c sw sw 16-21s-37e, 1¼ mi n by e extension.	1-19-47	3-11-47	6700	6560- 6630	Yeso li; Perm	F 432; 3/4"	40	Ant; geol	In excess of 30 wells to be drld on strength of e t
		OKLAHOMA—New Oil Fields									
Hughes		Gillespie & Sons' Meadors 1, nw nw sw 31-8n-9e, 1½ mi w Holdenville, W. pl.		3- 4-47	2818	2811- 2818	Booch sd; Penn	P 75	38	Str trp; dr	Small pl; no great significance,
McClain		Ryan Oil Co's Harris 1, ne nw se 25-5n-4w, 2 mi se Lindsay, N. pl.		3-18-47	10711	10432-10490	Bromide sd; Ord	F 528	45	Str trp; seis-dr	Opens gd prod s Lindsay, N. pl, on shoreline trend fr nw to se.
Okfuskee		Bay Pet. Co's Folansbee 1, sw se sw 16-13n-8e, 2 mi s Micawber pl		3- 5-47	3576	3565- 3576	Dutcher sd; Penn	F 90	37	Str trp; dr	In old area previous y drld to Wilcox.
		OKLAHOMA—New Oil Pay									
Okfuskee	Garden Grove	J. E. Crosbie, Inc. et al's Schultz 1, se ne sw 30-12n-7e		3-20-47	3364	3348- 3364	Earlsboro sd; Penn	F 93		Str. trp; dr	Previous prod fr Prue sd at 2900 ft.
		TEXAS DIST. 1 (SOUTH CENTRAL)—New Oil Field									
Caldwell		J. G. Pundt et al's C. F. Richardson et al 1, 330 fr se & swl 309-ac Tr, 5500 nwl 3800 fr nel A. Churchill sur, 5 mi sw Lockhart.	1-11-47	3- 8-47	1664	1606-	Austin ch; U. Cre	P 67	38		Additional development expected.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Oil Fields									
Calhoun		Texas Co's State of Texas (Amerada Unit) 1, 660 ft nl 1980 fr el State Tr 106, Matagorda Bay on ne ext of nwl S. Gonzales Gr, 40-ac Lse.	6-21-46	2-12-47	11530	4970- 4978	Sd; Miocene	F 192; 3/4"	27		Additional development expected.
Refugio	Roche	Hewit & Dougherty's Kathleen D. Roche 1-A, 467 fr nel, 3527 fr sel, Blk 18, Atkins & O'Neil Sbdn 6100 fr swl 350 fr sel D. J. Mitchell Sur, 3¾ mi ne La Rosa fld.	2- 6-47	3- 9-47	6818	6809- 6818	Frio sd; Olig	F 155; 1/8"	38.5		
Refugio	Wyrick	Clymore Co's John Zarsky 2, 820 s of nl 304-ac Lse, 1350 ne of nel Stanolind's 3209-ac Rooke Lse, 254 w of wl Sect 46, J. M. Aldrete Gr, 933 n of gas disc well, 1 mi n La Rosa fld.		3-15-47	6395	4944- 4948	Frio sd; Olig	F 126; 1/8"	40.7		Additional development underway in fld.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Oil Pay									
Karnes	Burnell-Wilcox	Stanolind's E. P. Ruhman, Sr. 1, 1090 fr nwl 3800 fr swl, 820 fr nel 255-ac lse. Tr 8, Jas. Johnson Sur, nw Pettus prod at Burnell, S. fld.	12-30-46	3- 8-47	8520	6966- 6970	Wilcox sd; Eoc	F 152; 3/4"	39		
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Distillate Field									
Live Oak		Continental's Albert W. West 1-D, 3650 fr swl 1000 fr sel J. Poitevent Sur, on 240-ac "D" Lse, 3½ mi nw George West.		3-30-47	7411	6780- 6793	Wilcox sd; Eoc	F 23; 3 mln; 3/32"			Some additional development expected.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Distillate Pay									
Refugio	Wyrick	Clymore Co's John Zarsky 3, 467 fr sl 430 fr wl Sect 46, Johnson & Pugh Sbdn Bonnie View Rch, 1 mi n La Rosa fld, 304-ac Lse, J. M. Aldrete Gr.	2-27-47	3-26-47	6408	5836- 5840	Frio sd; Olig	F 100; 3 mln; 1/4"	63.9		Additional sd in this new 1947 field discovery.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Oil Field									
Wharton	Gobbler Crk	Grubb & Hawkins' Rudolph C. Peters 1, 1496 fr el 1320 fr wl 466 fr sl 906.2 fr nl 90.87-ac Lse, Lyman Conkrite Sur, 1800-ac farmout Lse, 3 mi w Lakeview gas prod.	2-20-47	3-31-47	5503	4519- 4543	Frio sd; Olig	F 168; 5/32"	22.8		Additional development in area expected.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Oil Pay									
Brazoria	Stratton Ridge	E. Cockrell's Seaburn Est. Heirs 5, (OWWO) 815 fr wl 520 fr nl 2757-22-ac Lse, J. E. Groce 5-Lge Gr.	5-20-46	3-13-47	4986	4962- 4986	Sd; Miocene	F 130; 3/4"	29.2	SD	Some additional development expected.
		TEXAS DIST. 3 (UPPER GULF COAST)—Oil Field Extension									
Liberty	Cleveland, N.	Texana Pet. Co's R. Lee Kempner 1, 330 fr s&wl 765-ac Lse, Clayton Harper Sur, 3100 n Cleveland, N. prod, 8650 ne Cleveland, W. prod.	2-22-47	3-15-47	5788	5776- 5778	Yegua sd; Eoc	F 156; 1/8"	40.3	Flt	Additional development expected.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Distillate Field									
Wharton		Wirt Franklin Pet Corp's E. J. Steves 1, 660 fr s&wl 440-ac Lse, J. J. Dillard Sur, 2 mi n Louise gas prod.	2-18-47	3-10-47	6503	6351- 6358	Frio sd; Olig	F 5; 2.2 mln; 5/32"	50		Unimportant.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Distillate Pay									
Wharton	Louise	Wirt Franklin Pet Co's Martha Brown 1, 330 fr se&nel 160-ac Lse, nw¼ Sect 23, Morris & Cummings Sur, 2200 w prod.	2-13-47	3- 4-47	7135	6320- 6324	Frio sd; Olig	F 5; 2.3 mln; 1/4"	50	Ant	Unimportant.
		TEXAS DIST. 3 (UPPER GULF COAST)—Distillate Field Extension									
Harris	Esperson	Atlas O&R Co's A. B. Cohn Est. 1, start nec 248-ac Lse at Cedar Bayou, Meredith Duncan Sur, th 702.4 s 9° 10 min. e to lcn, ¾ mi w est.	10-22-46	1- -47	9094	8687- 8695	Yegua sd; Eoc	F 42; 1.1 mln; 1/8"	50	SD	Additional development expected.
		TEXAS DIST 3. (UPPER GULF COAST)—New Gas Field									
Wharton	Prasifka	Cockburn Oil Corp's Wharton Bk & Tr Co 1, 660 fr nwl 556 fr sel 57.5-ac Lse, AB&M Sur 2, 3½ mi ne Withers prod, 3½ mi e Lane city fld.	2-19-47	3-15-47	5720	4526- 4536	Frio sd; Olig	9 mln; 1/4"			Unimportant.
		TEXAS DIST 4 (LOWER GULF-SOUTHWEST)—New Oil Pays									
Brooks	Alta Mesa	Standard of Tex.'s Mestena O&G Co Lse 1-32, 4185 w of el 2655-ac Lse, La Mestena y Gonzales Gr, 4560 s alg el fr nec Sect 5, th 4185 w at ra.		3- 7-47	6851	4515- 4522 4958- 4970	Frio sd; Olig	F 142; 3/16" F 70; 1/8"	45.5 44.5		Import new oil reserve for fld.
Jim Wells	La Gloria	Magnolia's El Contesto 1-A, 517 fr nl 660 fr wl 40-ac Lse, Los Olmos & Loma Blanca Gr, e 53.6-ac lot 8, blk 7.	2-10-47	3-26-47	7800	7300- 7310	Frio sd; Olig	F 92; 1/8"	40	Ant	
Nueces	Minnie Bock, N	Atlantic's Mrs. J. R. Parr 1, 467 fr s&wl 120-ac Lse Joaquin Lopez de Herrera Gr, 1500 ne Atlantic's Ewing 1, gas disc well.	11- 7-46	2-25-47	10031	7680- 7689	Frio sd; Olig	F 30; 3/16"	50		
Nueces	Stratton	G. E. Sullivan's Fee 1, 467 fr wl 2817 fr nl 480-ac Lse, in Sect 5, Chas. E. Stratton Sbdn.	1-16-47	3- 7-47	7020	5855- 5887	Sd; Olig	F 32; 5/32"	43	Ant	

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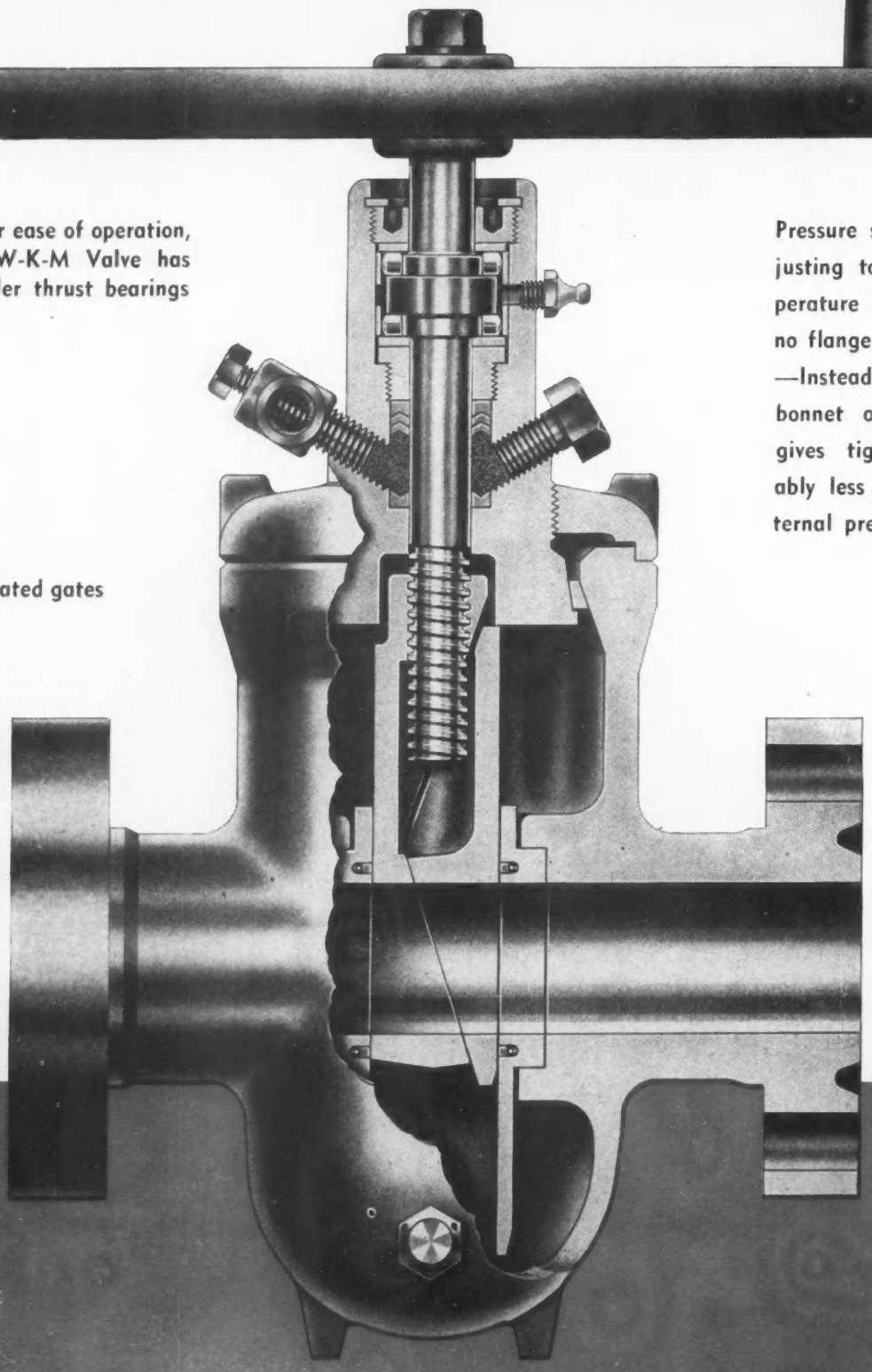

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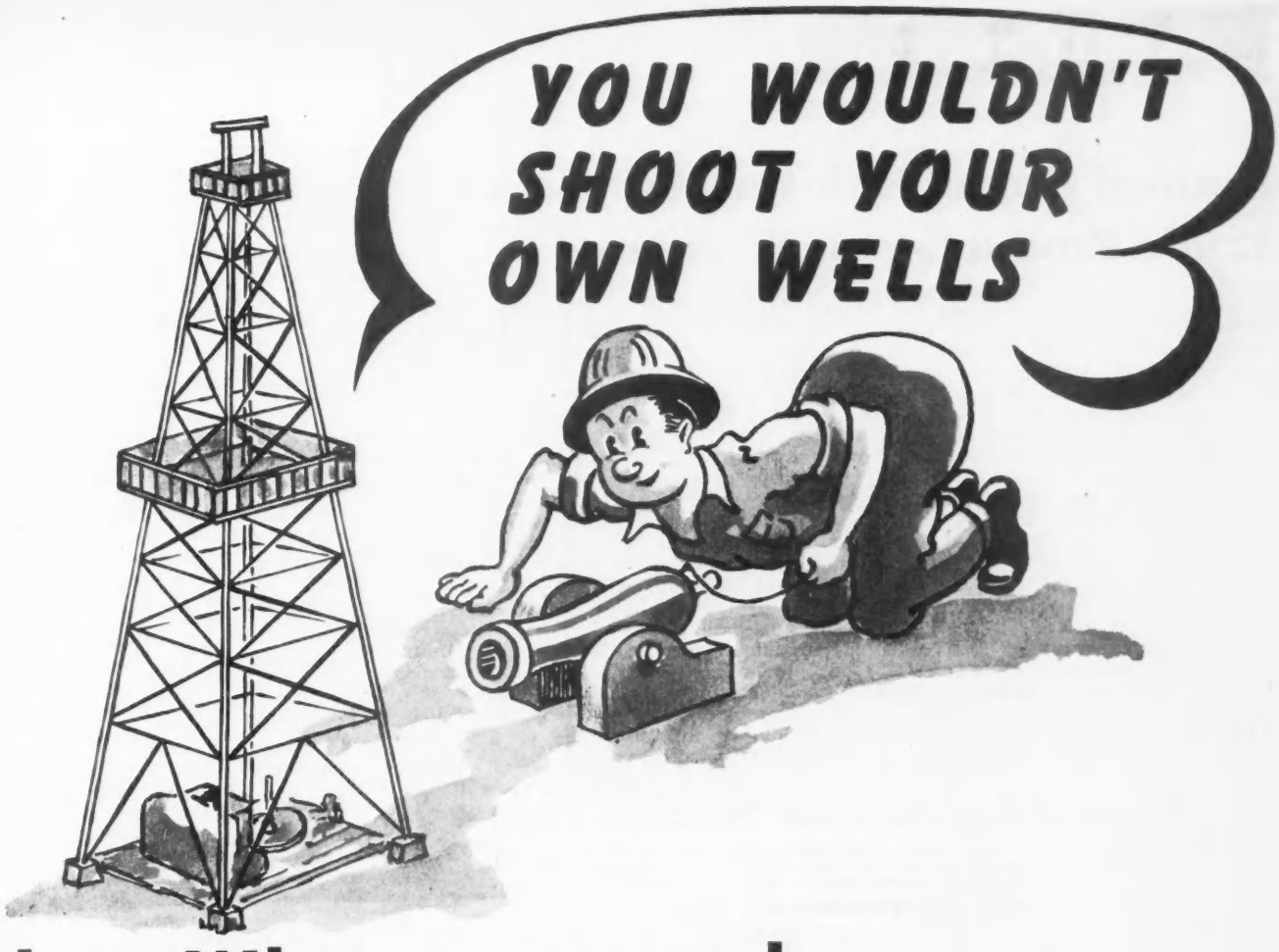
New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in March, 1947

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Inital Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
Starr	Kelsey, S	C. P. Burton et al's Mauro Villareal 2, 467 fr n&wl 203.3-ac Lse, n acreage of Tr 5, partition 2, Sta Cruz Gr, 1230 n of Villareal 1, extn. well.	12-22-46	2-14-47	7050	6062- 6080	Frio sd; Olig	F 145; $\frac{3}{64}$"	44.8	Flt	Important new oil source for fld.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Distillate Field									
Starr	Davenport	Dee Davenport's Fee State 1, 467 fr s&Wl Sur 974 and 289.27-ac Lse, 1½ mi n Frost fld, 2446 s alg el fr nec Sur 963, then 467 e at ra.	1-24-47	3-10-47	5501	4098- 4112	Frio sd; Olig	F 6; .6 mln; $\frac{3}{64}$"	58.4		Some additional development in area now underway.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Gas Pays									
Jim Wells		Southern Minerals Corp's S. B. Alley 1, 467 fr s&el lot 23, L. C. Collins Farm Lots Sbdn Comanche Crk Irr. Co, sur 1½ mi w Alice fld.	2- 1-47	3-20-47	5510	3577- 3587	Sd; Olig	F; no gge			Unimportant.
Jim Wells	Tom Graham-Alice E.	H. J. Mosser-Houston Nat. Gas Corp's A. O. Cook 5, 660 fr nl 1980 fr el 691-ac Lse, La Vaca Gr, 3½ mi s Alice.	11-28-46	2-25-47	8010	5627- 5637	Frio sd; Olig	F cond; 13 mln; open			
San Patricio	Midway	British American Oil Prod Co's D. I. Coggin 2, (OWWO) 467 fr nel 1550 fr wl Sect 82, Geo. H. Paul Sbdn 120-ac Lse.		3- 5-47	6505	3646- 3654	Frio sd; Olig	F 21 mln; open		SD lens	Unimportant.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—Gas Field Extension									
San Patricio	Willmann-Maegden	J. W. Gorman's B. W. Cox 1, 1263 fr nl 330 fr wly/el 1217-ac Lse, Delgado Gr, se Willmann fld, 5500 se Howell's Allen 1, dry hole.	2-28-47	3-15-47	5235	5210- 5218	Vicksburg sd; Olig	F 98; 6.6 mln; open			Some additional development expected.
		TEXAS DIST. 7-B (NORTH CENTRAL)—New Oil Fields									
Coleman	Read Mountain	Anzac Oil Corp-McQueen & Clevinger's C. V. Evans 1, 440 out nec sw¼ GH&H Ry 27, blk 1, 3 mi ne depleted prod.	11-18-46	3- 5-47	2935	2930- 2935	Fry sd; Penn	F 169; $\frac{5}{16}$"	44	Ant; geol	Small prod area due to proximity of failures.
Shackelford		R. H. Roark-L. F. Hooker-Jones & Stasney's W. H. Green 1, c nw sw T&P Ry, 48, Blk 11, ½ mi w by n shallow pool.	12-23-46	3-23-47	4840	2984- 3018	Palo Pinto li; Penn	P 7; 37 wtr	40	Ant; geol	Not commercial.
Stephens		Fred M. Manning, Inc's A. W. Mueller 1, 1725 fr snl and 725 fr wel Sect. 2258, TE&L Co, Sur 1⅝ mi nw isolated producer.	1-14-47	3-26-47	4232	3361- 3366	Bend li; Penn	F 152; ¼"	44	Ant; geop	Due to 20,000/1 gas-oil ratio, penalized to 5 bbl. daily allowable.
		TEXAS DIST. 7-B (NORTH CENTRAL)—New Oil Pays									
Callahan	Isenhower-Ellenburger	Dick Andrade-Scl Brachman & Kramer's Isenhower 1, 528 fr snl and 83 fr ewl Sect. 7, Bayland Orphan Asylum Lds, offsetting shallow pumpers.	11-22-46	3-12-47	3980	3979- 3980	Ellenburger dolo; Ord	P 20; 45 wtr	40	Ant; geol	Small prod area; thin effective pay zn near wtr level.
Stephen		Prairie O&G Co of Texas W. M. Chaney 1, 1537 out of sec Sect 2953, TE&L Co Sur, ⅝ mi n by e of gasser; 1⅝ mi s by e of oil disc.	2- 7-47	3-14-47	3365	3357- 3365	Bend li; Penn	F 1260; ¾"	43.6	Ant; geol	Unusually large natural fl with balanced gas-oil ratio. Probably small prod. area.
Stephens		S. Caprito et al's H. Compton 1, 1980 fr wel 660 fr nsl Sect 34, Bayland Orphan Home Sur, ne offset to gasser; 2 mi nw of nearest oil prod.	2- 4-47	3-20-47	3441	3433- 3441	Bend li; Penn	F 127; ¼"	39.1	Ant; geol	Probably sml oil prod area adjacent to gassers.
Taylor	Murphree	West Central Drlg Co et al's Pat Arnold 3, 330 fr snl 990 fr ewl Labor 25, Grimes CSL, Lge 146.	2-17-47	3- 5-47	2859	2839- 2859	Gunsight li; Penn	P 137; 20 wtr	39	Reef; geol	New zn may embrace more prod ar than shallower pays, with prolific fl likely fr apex of reef.
Taylor	Trent	S. B. Roberts et al's L. S. Tipton 2, 990 fr nsl and 330 fr wel of w 200-ac of n 400-ac T&P Ry 20, blk 18.	3- 4-47	3-21-47	2721	2694- 2720	Saddle Creek sd; Penn	F 433; ¾"	40	Ant; geol	This upper pay not commercial in 2 original producers and 3 offset failures.
		TEXAS DIST. 7-C (WEST CENTRAL)—New Oil Field									
Crockett		T. W. and J. M. Loffland Jr's V. B. Cox 1-A, 215 fr nsl and 948 fr wel T.C.Ry. 40, Blk S-T, 16 mi s nearest prod.	5-16-46	3- 7-47	1137	995- 1095	Sand Andres li; Perm	P 25	28	Ant; geol	Nearby failures discount import of area.
		TEXAS DIST. 8 (WEST)—New Oil Pay									
Ector	Jordan-Ellenburger	Gulg Oil Corp-E. E. Fogelson's University 1-A, 680 fr ewl and 662 fr nsl Sect 7, Blk 35, twin to 3700-ft producer.	9-23-46	3-18-47	8985	8925- 8935	Ellenburger dclo; Ord	F 224; 58 wtr; $\frac{3}{16}$"	42.7	Ant; geol-geop	Wtr may be attributed to ineffective cement; possibly 600 acs prod fr Ellenburger.
		TEXAS DIST. 8 (WEST)—Oil Field Extension									
Scurry	Northwest	John Odstroil and Mid-West Drlg Co's Ellis House 1, 330 out nwc Sbdn 17, Sect 3, J. P. Smith Sur, blk 1, 1 mi e ext.	11-19-46	3- 6-47	1694	1615- 1694	San Andres li; Perm	P 164	25	Ant; geol	Acreage betw outpost and fld virtually proved and will be drld up.
		TEXAS DIST. 9 (NORTH)—New Oil Fields									
Cooke		Phillips Pet Co's L. M. Atcheson 1, 2310 fr wel and 990 fr snl of Tr in s part Jackson Davis Sur A-331, 2½ mi se nearest prod.	1- 8-47	3-20-47	2064	1936- 1982	Ellenburger dclo; Ord	F 646; ½"	40.2	Ant; cd	Disc while core-drlg to Ellenburger. Sml Ellenburger ar, but shallower pays likely.
Foard		Stanolind's J. G. Halsell 1, 1980 out of sec John Shearer Sur 9¾ mi sw nearest production.	10-26-46	3-21-47	5912	4822- 4838	Strawn li; Penn	P 17	39	Ant; geol	Not commercial, considering depth and thin pay.
Jack		Warren Oil Corp's J. D. Gillespie 1-C, 330 w of m/w/e and 1388 n of m/s/s J. B. McNeil Sur A-1796, ¾ mi n by e of production.	12- 6-46	3- 3-47	5520	5480- 5520	Ellenburger dolo; Ord	P 20; 35 wtr		Ant; geol	Not commercial considering sml oil yld and predominance of wtr.
Young		Jas. Blair Baker et al's D. L. Wolf 1, 900 fr snl and 2600 fr ewl Sect 297, TE& L Co. Sur, ½ mi se prod and separated by failures.	12- 2-46	2-27-47	689	678- 689	Cisco sd; Penn	P 9	38	Ant; geol	Small producing area.
		TEXAS DIST. 9 (NORTH)—New Oil Pays									
Archer		W. T. Graham et al's R. Campbell 2, 330 fr nsl and 450 fr ewl of n½ BB&C Sur A-36, twin to 5060-ft disc pumper.	2- 1-47	3-10-47	1020	1013- 1020	Cisco sd; Penn	P 5	38	Ant; geol	Small shallow area within group of failures.
Cooke	Walnut Bend, N. W.	Texas Co's Gainesville Nat'l Bk 3, 330 fr nsl 6300 fr wel of T. W. Ward Sur, A-1089.		3-11-47	5481	4494- 4519	Strawn sd; Penn	F 293; $\frac{12}{32}$"	38.9	Ant; geol	Considered stray lenticular oil sd; to be erratic in performance.
Cooke	Wilson	Burk Royalty Co's R. A. Belcher 3, 330 fr ewl 430 fr nel of 51.5-ac Tr, or 330 fr ewl 1450 fr nsl W. W. Crisp Sur A-221.	2- 4-47	3- 8-47	4111	3452- 3472	Strawn sd; Penn	P 130	34	Ant; geol	Involves stray lenticular oil sd and localized.
Jack		Thos. E. Berry-Hill & Hill's Mrs. D. C. Clayton 1, 990 fr snl 1800 fr m/e/w lines of L. Knight Sur A-324, 1900 w by n of 4600-ft Marble Falls discovery.	1-27-47	3-26-47	5158	5124- 5149	Mississippi li; Miss	F 972; ½"	45.3	Ant; geol	Outstanding for county for this zn; penetrated pay without encountering wtr.
		TEXAS DIST. 9 (NORTH)—New Gas Field									
Young		Warren Oil Corp's Bulah Martin 1, 1263 out of swc of M. DeWitt Sur A-1412, 1⅝ mi w by n Kendall fld.		3-10-47	4842	4212- 4217	Bend cgl; Penn	12.9 mln; $\frac{14}{64}$"		Ant; geol	Comparatively thin pay; potential based on brief gge.
		TEXAS DIST. 10 (PANHANDLE)—Gas Field Extension									
Gray		Phillips Pet Co's Mrs. D. Stoebuck 1, 2315 fr wel 2321 fr nsl H&GN Ry 15, Blk B-2, 3½ mi se ext.	1-20-47	3- 3-47	2677	2537- 2646	Granite Wash; Permian	1.4 mln		Ant; geol	Gas volume considered small for district.

[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale; ser, serpentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleistocene; Plic, Pliocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.
[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches.
[3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace.
[4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology; tb, torsion balance.



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Refined Products Output Cut Back; Crude Production at High Level

Output of all refined products was cut back during the week ended April 19, resulting in lowered stocks, according to The American Petroleum Institute. Crude production remained at the high level reached the week before and sent refinable stocks to a new 3-year high.

Crude production during the week of April 19 averaged 4,912,000 barrels daily, a drop of 1000 barrels a day from the previous week's rate, but 226,000 a day more than was produced daily in the like period of last year. Daily crude runs to stills averaged 4,709,000 barrels, an increase of 42,000 barrels over last week's runs and 72,000 barrels less than daily runs in the comparable week a year ago.

Refinable crude stocks totaled 231,546,000 barrels on April 12, the Bureau of Mines reported. Those stocks were 1,145,000 barrels higher than a week earlier and 10,286,000 barrels more than stocks a year ago. Stocks as reported for April 12 were at the highest level since June 3, 1944, when 234,476,000 barrels were reported.

Production of gasoline, which includes natural blended at the refinery, was reduced 124,000 barrels to total 13,966,000 barrels for the week. That was 182,000 barrels more than was produced in the like week of last year. Finished and unfinished gasoline stocks were lowered 629,000 barrels during the seven-day period and ended the week at 105,592,000 barrels, which were still 4,920,000 barrels over inventory of a year ago.

Distillate fuel oil output in the week amounted to 5,263,000 barrels, 236,000 barrels less than the previous week's production and 61,000 barrels under prodction of the comparable period of 1946. Stocks of light fuel oils were lowered 549,000 barrels to 31,470,000 barrels, which were only 86,000 barrels more than were on hand a year before.

A reduction of 271,000 barrels from the previous week's residual fuel production brought the week's output to 7,961,000 barrels, 1,087,000 barrels less than in last year's week. Withdrawals totaling 197,000 barrels during the week lowered stocks of residual to 42,749,000 barrels. That amount was 5,732,000 barrels over residual in storage a year before.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.
(All Figures in Thousands of Barrels—Add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	4,913	4-12	4,986	3-15	231,546	4-12	107,576	3-29	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	10- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	4-11	4,667	4-12	220,313	2- 8	94,882	1- 4	31,470	4-19	42,703	3-22

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 29	4,865	4,843	227,529	14,396	107,576	5,969	32,737	8,668	43,364
April 5	4,892	4,772	230,401	14,374	106,966	5,653	32,358	8,206	43,541
April 12	4,913	4,667	231,546	14,090	106,221	5,499	32,019	8,232	42,946
April 19, 1947	4,912	4,709	.....	13,966	105,592	5,263	31,470	7,961	42,749
April 20, 1946	4,686	4,781	[3]221,260	13,784	100,672	5,324	31,384	9,048	37,017
Change:									
In Week	—1	+42	+1,145	—124	—629	—236	—549	—271	—197
In Year	+226	—72	+10.286	+182	+4,920	—61	+86	—1,087	+5,732
In Year	+4.8%	—1.5%	+4.6%	+1.3%	+4.9%	—1.1%	+0.3%	—12.0%	+15.5%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, April 13, 1946.

Demand Continues Heavy for All Petroleum Products

The week saw continued heavy demand for the entire line of petroleum products at prices that were steady and unchanged. Gasoline demand is steadily increasing and supplies are scanty in some areas and are being closely held in others. Fuel oil demand is still above normal and although it is showing slight seasonal decline, it is not allowing material to be added to stocks.

Although product prices were generally unchanged there were a few adjustments made by individual suppliers. One North Texas refiner reduced his Ethyl and regular-grade gasoline prices .25 cent to 9 and 8 cents, respectively. Howevêr, other refiners in the area continued to quote from 9.25 to 10 cents for Ethyl and from 8 to 8.3 cents for regular-grade. Another refiner increased several grades of Mid-Continent pale neutrals by 1 cent. New price ranges were 18-19 cents for 180 viscosity, 19.5 to 20 cents for 250, and 20.5 to 21 cents for 280 viscosity.

In Pennsylvania a lower field refiner announced a .25-cent advance in light fuel prices. New prices are 7.625 cents for No. 1 fuel, 7.5 cents for No. 2, 3 and 36-40 fuels. Prices for other products in this area were unchanged. Several Pennsylvania refiners reported continued easing in light fuels demand as some industrial users returned to natural gas with improvement in supplies. But refiners generally said the market remained firm and indicated that slackening was only permitting them to cut down on backlog orders without allowing buildup of stocks.

Open market trading was reported still virtually halted on the Gulf Coast, as supplies of all products remained closely held. In this area inquiry remained active for gasoline, light and heavy fuels and some buyers were reported seeking material without regard to price.

Mississippi Group Meets

The second annual meeting of the Mississippi Oil and Gas Engineering Committee was held in Jackson April 25. Principal business of the affair was the election of officers and a report on activities during the past year by J. K. Wright, Jr., acting director. The committee was organized in 1945 with Alec Crowell as its first director. Crowell secured leave of absence in December to go with the Oil and Gas Division of the Department of the Interior, but he has since become associated with the Texas-Eastern Pipeline Corporation as vice president.

90°

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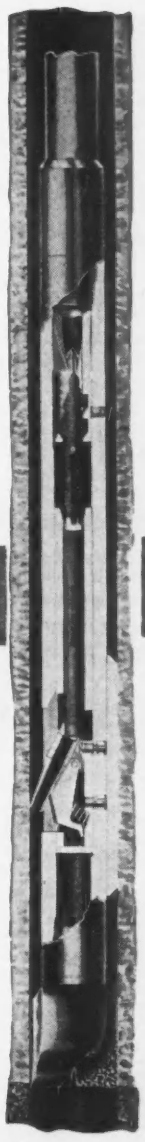

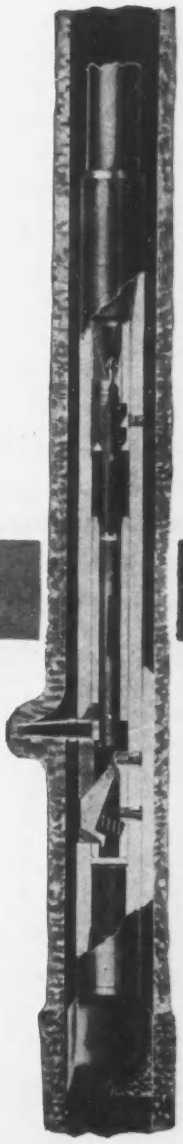

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Three Important Discoveries in West Texas Awaiting Completion

Important discoveries awaiting completion increased to 3, with the University-Waddell prospect rated as the most significant strike since the opening of the TXL multi-pay field; drilling gains measured by availability of casing; Gaines County wildcat passes up show in San Andres, but likely forerunner of a discovery.

Terry County: Amerada Petroleum Corporation's Adair 1, C SW SW PSL 4, Block C-37, 6½ miles north by west of the Cedar Lake field, has uncovered a 31-33-gravity San Andres field that will embrace a substantial producing area since outlying failures logged nominal shows in this zone. Pipe has been set on bottom at 4945 feet for the completion of Adair 1 after a series of drill-stem tests below 4818 feet confirmed the presence of commercial production without formation water. The best production showing was from a test at 4908-30 feet that yielded 1856 feet of 31.4-gravity oil, while a final test at 4925-45 feet returned 670 feet of oil- and gas-cut mud without water. The San Andres was topped at 4400 feet, with elevation 3220 feet. This marker correlates 51 feet high to Tide Water Associated Oil Company's Buckner 1, 1¼ miles east by north, and 130 feet high to Stanolind Oil & Gas Company's Texas L&M Company 1, 2½ miles northwest. The latter had a show of oil with water when tester was used at 4959-5062 feet, while Buckner 1 logged oil staining and saturation at 4900-60 feet. Amerada has a solid block of about 4000 acres, and will control the bulk of the productive area. A pipe line connection will be available.

Crane County: Gulf Oil Corporation's University 1-HH, SW NE Sect. 3, Block 31, 3¾ miles north by east of the Block 31 field, was setting pipe on bottom at 10,950 feet, or 362 feet in the Ellenburger, before attempting further production tests because of the excessive formation pressure. Entering the Ellenburger at 10,588 feet, and effective pay near the 10,625-foot level, this discovery yielded production on each drill-stem test to 10,900 feet, except the section at 10,750-800 feet that tested 40 feet of mud with a trace of oil and gas, but the testing tool may not have functioned properly. The final drill-stem test at 10,850-900 feet returned sweet gas to the surface within 21 minutes and a flow of 165 barrels of 42.8-gravity oil in 1 hour through ⅝-inch choke at 10,836 feet. Shutin bottom-hole pressure built up to 5200 pounds. This pressure compares with 4380 pounds originally in the Keystone thick-pay Ellenburger area.

University 1-HH is carrying open hole below 4586 feet, while it indicated commercial production in the Devonian, Silurian, McKee and Waddell zones. It is scheduled to be deepened after pipe is landed in order to determine the thickness of the pay as a guide for future development. The company is starting Waddell 1-1-E ½ mile north by east, and another location will be staked. Stanolind has authorized a southwest offset on its 160-acre lease. A direct pipe line outlet will be available before the well is completed. The area has been designated as the University-Waddell field.

Thickness of the Ellenburger pay as now determined points to the presence of a major producing field. The discovery has confirmed the geophysical picture that induced the company to pay $422,000 cash for the 1600 acres of University leases. Indications are that Gulf Oil Corporation has about ¾ of the productive acreage. Preliminary analysis of the Ellenburger oil places it on a par for sweetness and lube oil content with the Keystone field.

Gaines County: Honolulu Oil Corporation and DeKalb Agricultural Association's White-Shelton 1, C NE NE CCSD&RGNG 404, Block G, 4¼ miles northwest of Cities Service Oil Company's Riley 1, which is being completed as a major northwest extension for the Doss 2-pay field, was drilling at 4810 feet after indicating possible production in the San Andres below 4619 feet. Honolulu is starting Kirschner 1, SE SE Sect. 430 and a mile west by north to forestall lease expiration. White-Shelton 1 entered the brown lime at 3930 feet and Grayburg at 4170 feet with elevation of 3477 feet, correlating high to outlying failures, but is 108 feet low to Riley 1 on these markers.

Ector County: Shell Oil Company's Cochran 1-A, C NE SE T&P 34, Block 46, T-1-N, northwest outpost for the TXL field with a failure separating it from Ellenburger production, tested oil- and gas-cut mud and an abundance of sulphur water at 7752-949 feet in Devonian, topped at 7930 feet, with elevation 3349 feet. Another test was pending at 8071 feet. Top of Devonian correlates 27 feet low to the failure, and 29 feet high to the nearest Devonian well 1½ miles south. A minimum of 20 Devonian producers will be added if Cochran 1-A yields production on the pending test, while northwest extensions will be in order, as the nearby failure is at the dividing line between Devonian and Ellenburger production.

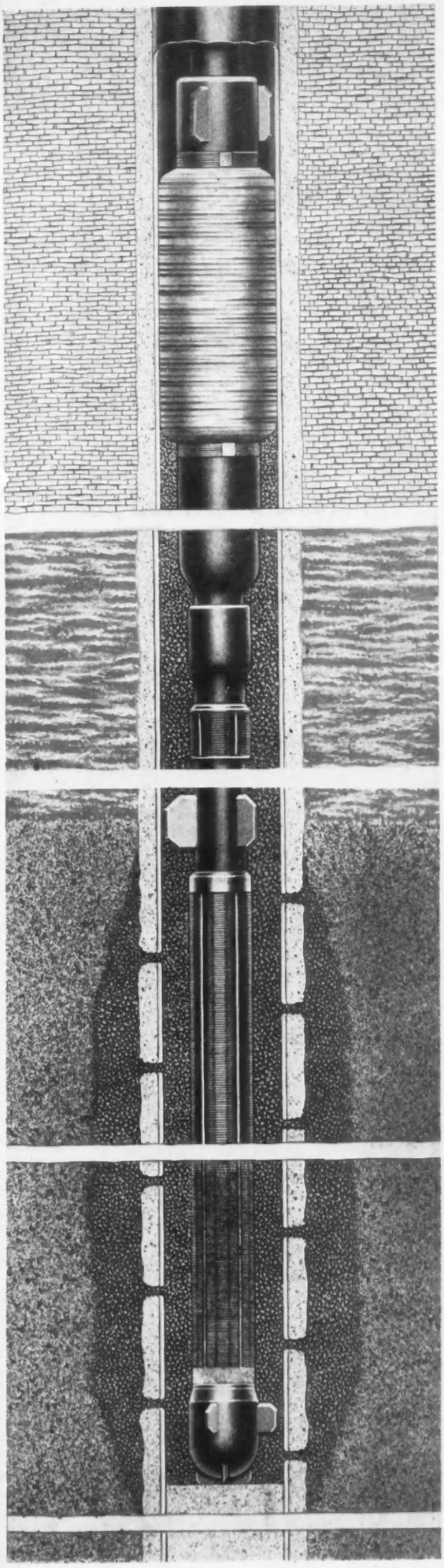
Crockett County: Plymouth Oil Company is starting north and east offsets to Cities Service et al's Owen's 1-B, wildcat between the Clara Couch and Olson shallow fields, on the strength of the prolific oil and gas flow passed

Wells Completed in the United States in Week Ended April 19, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	This Week 1946
Alabama											1	1	1	1	1
Arizona															1
Arkansas	2				3	5							5	7	2
California	24		1		2	27	2				3	3	32	37	37
Colorado											1	1	1	4	5
Florida														1	
Illinois	15				8	23		1			4	5	28	33	34
Indiana	5		1		4	10		2			2	4	14	12	5
Kansas	28		7		8	43					6	6	49	37	27
Kentucky	3		3		2	8							8	6	7
Louisiana	10	3			2	15					4	4	19	23	10
N. Louisiana	5	2			1	8					2	2	10	11	10
S. Louisiana	5	1			1	7					2	2	9	12	
Michigan	2				1	3					1	[1] 1	4	2	19
Mississippi	5				1	6							6	8	4
Montana	3					3							3	2	9
New Mexico	12		2			14	2						16	8	2
New York	15			10	1	26							26	30	26
Ohio	5		11		10	26							26	23	7
Oklahoma	34		2		20	56	2				10	10	68	60	46
Pennsylvania	27		2	15	1	45	1						46	49	55
Texas	110		7		27	144	8	4		1	27	32	184	165	156
Districts:															
1—S. Central	6					6					2	2	8	5	2
2—Middle Gulf	5		1		1	7					4	4	11	14	[1] 1
3—Upper Gulf	8		1			9					2	2	11	16	9
4—L. Gulf-S. W.	8				1	9		2			6	8	17	25	30
5—E. Central	3		1			4					1	1	5		[2] 2
6—Northeast	1		2			3				1		1	4	11	15
7-B—N. Central	10				2	12		1			2	3	15	13	[3] 3
7-C—W. Central	5				1	6					1	1	7	7	[4] 4
8—West	33				2	35	6	1			3	[4] 4	45	35	36
9—North	29				20	49	2				6	[6] 6	57	31	60
10—Panhandle	2		2			4							4	8	4
Utah											1	1	1		
West Virginia			10		4	14							14	8	11
Wyoming	4					4					1	1	5	3	1
Total U. S.	304	3	46	25	94	472	15	7		1	61	69	556	519	465

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S. W. [2] East Central included with Northeast. [3] N. Central included with North. [4] West Central included with West.



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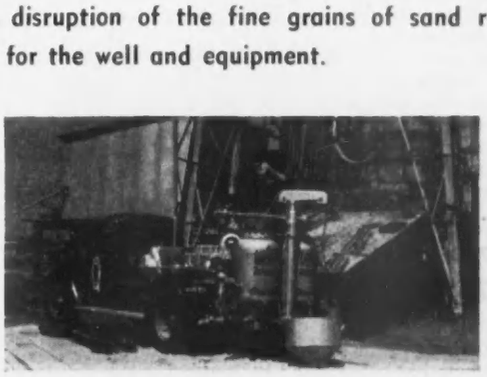

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up by the latter near the Permian-Pennsylvanian contact. The new operations will try for completion in the Pennsylvanian, while Owens 1-B has progressed to 6750 feet to explore the Ellenburger before running pipe for completion. This pending strike involves a large structure.

• West Central Texas

Alexander and Cade Areas in Jones County Get Extensions

Extensions given 2 Jones County areas; new oil fields in Stephens County proving erratic; offset to Callahan County Ellenburger oil discoveries yields gas.

Jones County: Max Eversberg et al's Harvey 1, NW SW NW T&P 5, Block 14, extended the Alexander field ½ mile east in pumping 78 barrels initial from the lower pay at 1605-09 feet. George D. Morgan and Con-Tex Petroleum Corporation, owners of the greater portion of the field, have started Alexander 28 as a west offset to the extension well.

Ungren & Frazier's Goode 1, Wm. Thurmond Survey and 1350 feet northeast of the Cade pool discovery, filled 600 feet with oil in drilling 5 feet into the Swastika sand at 2998 feet, and pipe has been set for completion. This confirmation well correlates flat with the discovery.

Stephens County: Fred M. Manning Inc.'s Curry 1-A, NWc Sect. 2265, TE&L Company Survey and south offset to the northeast extension producer for the Muller area, set pipe to try for completion at 3460 feet after testing a nominal show of oil with water in the upper portion of the Bend, topped at 3324 feet.

S. Caprito's Clarence Compton 2, NE NW Sect. 53, Orhpan Asylum Lands and southwest offset to a flowing oil discovery in the 3400-foot Bend, missed this pay and was abandoned at 4246 feet.

Woodley Petroleum Company and Jake Sandefer's Chaney 1, SE NW Sect. 2953, TE&L Company Survey and northwest offset to a recent oil discovery, entered the Bend at 3305 feet and flowed oil and gas through tester at 3345 feet. The oil-water contact was established near the 3353-foot level. Pipe was set for completion through perforations.

Callahan County: E. E. Fogelson and Mel Ingleright's Wallace 1, west offset to their Ellenburger pumping discovery for the Baum shallow area, failed to encounter oil in drilling to 3882 feet in Ellenburger, topped at 3822 feet or 13 feet high and will complete as a gasser through perforations. The discovery logged a gas-cap zone in Ellenburger before entering oil pay, but the gas flow declined sharply.

California Standard to Equip Sea-Going Ships With Radar

Plans to install radar as standard equipment on all its sea-going vessels were announced by Standard Oil Company of California.

The company disclosed that use of the war-developed instrument had proved highly satisfactory on the S.S. R. G. Follis. This Standard vessel was launched in October as the first post-war tanker built in the U. S. with radar embodied in its original design.

• North Texas

Haskell County's New Strawn Area Attaining Importance

Haskell County's new Strawn area attaining importance, and shallow pay in prospect; production revival due in depleted Montague County pool.

Haskell County: Amerada Petroleum Corporation's Holt 1, north extension for the Humphrey-Chapman 2-pay field, pumped 91 barrels of oil with 1 percent water from Upper Strawn lime perforations at 40-68-98 feet, having plugged back from 4287 feet. Amerada's Holt 2 was drilling shale at 2070 feet. Mudge Oil Company's Baldwin 1, northeast offset to the discovery, made initial perforations at 4080-85 feet and flowed 9 barrels of oil hourly through ¼-inch choke. The company's Baldwin 2, situated 933 feet south, was nearing the Strawn after passing up indicated production in the Home Creek at 2489-98 feet, while Baldwin 3 will be drilled as a twin well to try for completion in this shallow zone. Tom Humphrey is starting Baldwin 1 on the southeast edge of the field.

Wilbarger County: Humble Oil & Refining Company's McCaleb 6, SE NE H&TC 34, Block 15, Ellenburger prospect for the north portion of the Fargo multi-pay field, was nearing the Strawn-Simpson contact in drilling at 5940 feet. It is ½ mile northwest of Amerada's field discovery that plugged off commercial production in Ellenburger at 6306-30 feet, and possible production in Simpson at 6254-62 feet.

Collin County: Humble's Wester 1, A. J. Culwell Survey and 1 mile south of Weston, was abandoned at 7850 feet after drilling 1020 feet of barren Ellenburger, which attains a maximum thickness of 2567 feet elsewhere in the district.

Montague County: Continental Oil Company's Magee 1, prospective discovery 3 miles southeast of Montague, failed to respond to nitro shot at 6470-90 feet in Bend conglomerate, although the well tested 2 barrels of oil hourly on 16-hour swabbing test before shot. Commercial production is likely from Strawn oil sand at 6018-40 feet.

Houston Bowers et al's Howard 1, SWc E½ Block 82, Kaufman County School Lands and ½ mile west of Shell's depleted Strawn discovery at 3023-45 feet, was running pipe to complete after logging oil-saturated sand at 3013-24 feet.

Cooke County: Shell Oil Company and Seitz-Comegys & Seitz, Inc.'s Pearce 1, S. C. Adkinson Survey A-10, wildcat south of the Wilson field, was due to be abandoned after proving dry in Ellenburger at 4140-209 feet. Seitz-Comegys & Seitz, Inc.'s, Bush 1, A. Livingston Survey A-598 and 1½ miles east of the Woodbine multi-pay Strawn area, was drilling shale at 3690 feet on 5000-foot depth contract. The firm has assembled a large lease block in Fannin County School Lands Survey and centering 2 miles north of Callisburg with plans to drill a 5000-foot test.

Gas Course Program Set

Program has been completed for the annual Southwestern Gas Measurement Short Course on the campus of the University of Oklahoma at Norman, May 6-8. D. A. Hulcy, president of the Lone Star Gas Company, will deliver the principal address of the opening day. Morning sessions will be of a general nature, while afternoons will be divided into lectures and demonstrations.

• East Texas

Boynton Field Confirmation Correlates High on Paluxy

Confirmation well for Boynton field correlates high on Paluxy; Travis Peak yields water in Kaufman County prospect; Opelika oil extension develops excessive gas.

Smith County: Phillips Petroleum Company's Curry-Opal 1, J. A. Malone Survey and northeast offset to the Boynton field discovery, entered the Paluxy series at 7415 feet, or 2 feet high, and was changing to core barrel after reaching sand at 7466 feet. The bottom 3 feet showed oil staining. The discovery was completed from sand at 7516-27 feet. Humble Oil & Refining Company's Gary 1, 1300 feet east of the discovery, is checking high on upper markers, having entered the Austin chalk at 4510 feet, and was drilling at 4715 feet.

Kaufman County: Humble's Guy 1, Smackover prospect, entered Travis Peak at 6254 feet, or 9 feet high to a 6475-foot failure 4300 feet southwest, and recovered salt water sand in coring to 6311 feet with diamond core.

Henderson County: Gulf Oil Corporation's Laco 1, recent southwest extension of the oil section of the Opelika field, developed excessive gas-oil ratio while making an extended test of Rodessa perforations at 8756-8805 feet. Last gauge credited the well with flowing 75 barrels of 44.4-gravity oil daily, with gas-oil ratio 19,000/1, through 13/64-inch choke.

Wood County: R. J. Caraway et al's Mullinax-Martin 1, Mary Polk Survey and exceptionally high structurally for the general area, entered dry Paluxy at 7780 feet, and no shows were encountered in drilling to 7890 feet.

Shell Oil Company's Goldsmith 12, Quitman field Smackover test, was fishing for stuck drill pipe at 12,172 feet in dry Cotton Valley. In the Hawkins area, Humble's Little Sandy Club 1, Wideman Survey, entered dry Travis Peak at 9312 feet, and was drilling shale and sand at 9460 feet, while McKnight 1 was drilling shaley-sand at 12,525 feet.

Freestone County: The Texas Company's White 1, outpost for the Fairfield multi-pay gas field and deepest test in the district by a wide margin, was drilling lime at 14,240 feet. The Smackover had not been reached when electric log was run to 13,970 feet.

Cherokee County: Standard Oil Company of Texas' New Birmingham Development 1, 8 miles southwest of Jacksonville, has opened a gas field. The discovery had a calculated open flow potential of 170 million cubic feet of gas and 500 barrels of distillate daily, with a reservoir pressure registered at 4223 pounds. It is producing through perforations at 8608-52 feet in the Rodessa horizon, one of the important producing levels in East Texas and North Louisiana. Standard has approximately 20,000 acres under lease around the discovery.

Marion County: Magnolia Petroleum

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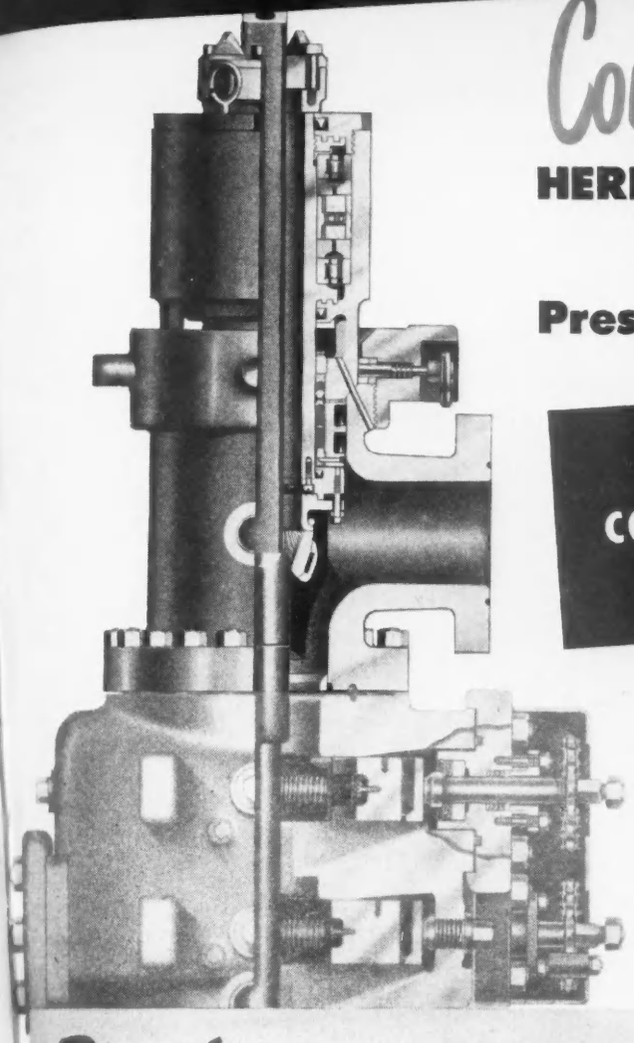

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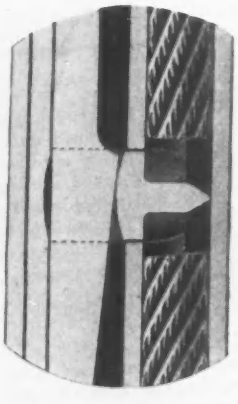

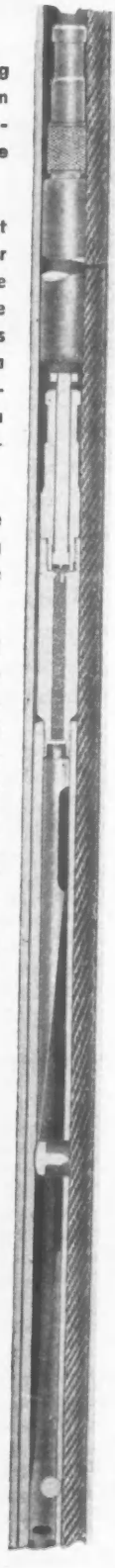

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Company et al found a lower Travis Peak distillate pay for the Lassater field in Hall Estate 1, M. W. Moody Survey, in an interval below that from which the field discovery produces. Operators were perforating at 7995-8010 feet for another production test of a porous section and may test 2 more zones before the well is completed. A number of tests had been made of the interval at 8736-50 feet, the latest of which flowed 30 barrels of distillate and gas in 11 hours through ⅜-inch choke.

Harrison County: Arkansas Fuel Company et al's M. C. McCauley Sr. 1, P. Dougherty Survey, prospective Travis Peak field opener, was flowing a steady rate of 2.66 barrels of 43-gravity oil per hour through 10/64-inch choke from perforations at 6446-52 feet.

East Texas Producers Sold

A. Bryon Diffie, Dallas and New York financier, has announced purchase of five producers on the Deason five-acre tract in the Juan Ximines Survey and L. J. Pinkston five-acre tract in the Juan B. Cadena Survey, Rusk County, East Texas field, from J. Fred Schoellkopf et al of Dallas. Consideration was reported to be $283,000.

Mineral Rights Purchased

The Sunflower Natural Gas Company, Inc., has purchased mineral rights on 28,000 acres of land in the Hugoton gas field of southwestern Kansas. Acreage covers 43½ square miles west of Liberal, Kansas, and straddles the Oklahoma-Kansas state line.

• South Central Texas

Atascosa County's Charlotte Field Given New Producer

New producer completed at Charlotte; Bandera wildcat coring in hard lime; wildcat east of Harper abandoned; Magnolia completes good producer at Luling.

Atascosa County: A new producer at Charlotte field is The Bering Company's Koemel 4, west offset to The Texas Company's D. Thompson 1. On potential the well flowed 69 barrels of 34.7-gravity oil daily on 5/32-inch choke with tubing pressure 225 pounds, casing pressure 200 pounds, and gas-oil ratio 280/1. Total depth is 5209 feet with 7-inch casing set to 5160 feet and completion from open hole.

Bandera County: Ray E. Pool was coring at 2140 feet in hard lime at E. L. Rainey 1, wildcat 5 miles east of Vanderpool. The test is in the north corner of the south quarter of GH&SA RR Survey 16, A-1429.

Gillespie County: L. Underwood Rowntree has abandoned Knott 1 as a dry hole. This wildcat, located 8 miles east of Harper, was a reworked dry hole, originally drilled and abandoned in September, 1945, at total depth of 700 feet. Total depth of the dry hole now is 3190 feet in granite.

Caldwell County: Magnolia Petroleum Company has completed Alf Mercer 19 as an excellent oil well at Luling field. On potential the well pumped 248 barrels of oil daily from perforations in the Edwards lime at 2166-74 and 2177-84 feet. Total depth is 2238 feet with 5½-inch liner set on bottom.

• Southwest Texas—Lower Coast

Webb County Has Discovery Northeast of Volpe Field

Gas field discovered northeast of Volpe field; The Texas Company's deep Yturria wildcat tries to blow out; 2 Nueces County discoveries being completed; new pay discovery at West Sinton completed.

Webb County: A gas discovery is Hickok & Reynolds' Amado Perez et al 1, wildcat northeast of Volpe field and 10 miles northeast of Bruni. Total depth is 2631 feet with 5½-inch casing set to 1328 feet and perforated at 1266-76 feet for completion. The well was cleaning with no gauge of gas flow made.

Willacy County: The Texas Company's Yturria L&LS 6, deep wildcat 8 miles northeast of Raymondville, tried to blow out while running electrical log to total depth of 16,006 feet. The test is now being under-reamed and it is reported to have been drilling in sand for several hundred feet. This wildcat the deepest ever drilled in South Texas, has 5-inch liner set to 14,490 feet.

Nueces County: Skelly Oil Company's W. C. Rivers 1, wildcat 1½ miles southeast of Agua Dulce townsite and 1½ miles west of Agua Dulce field, was being completed as a discovery. Total depth is 7358 feet with 5½-inch casing set to 6066 feet and perforated at 5992-6000 feet for completion. On latest test the well produced 18 barrels of oil daily on gas-lift. The discovery is in the northeast corner of Lot 6, Sect. 26, Benton Pasture Subdivision.

Pan American Production Company et al's Loruth Smith Rivers 1, wildcat a mile west of Agua Dulce townsite and 2½ miles south of Richard King field, is a gas discovery. Total depth is 6315 feet with 5½-inch casing set to 6031 feet and perforated at 5528-39 feet for completion. The well was shut in without a gauge, shutin pressure being 2100 pounds. Attempts were made to complete the well for an oil producer at the 6000-foot level but salt water with a small amount of oil was recovered in each attempt.

San Patricio County. Jones & Morgan's Sims 3, new pay discovery at West Sinton field, has been completed. From perforations at 5136-42 feet the well flowed on potential 181 barrels of 36.4-gravity oil daily through ¼-inch choke with gas-oil ratio of 663/1. Total depth is 5186 feet with 5½-inch casing set on bottom.

Educational Allowance Hiked

Increased costs of self-improvement are recognized by the Socony-Vacuum Oil Company, Inc., in announcing a 50 percent increase in allowances to employes for spare-time educational courses.

• Middle Texas Coast

Potential Run on Discovery In Mineral Field Vicinity

Potential run on new Yoward discovery in Bee County; Calhoun County wildcat shows for production; Wilcox production at Hord's Creek discovered; new pay zone discovered at Heyser.

Bee County: Potential has been run on Gasoline Production Corporation's Yoward 1, discovery about 1¼ miles

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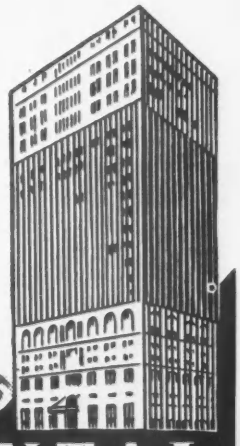

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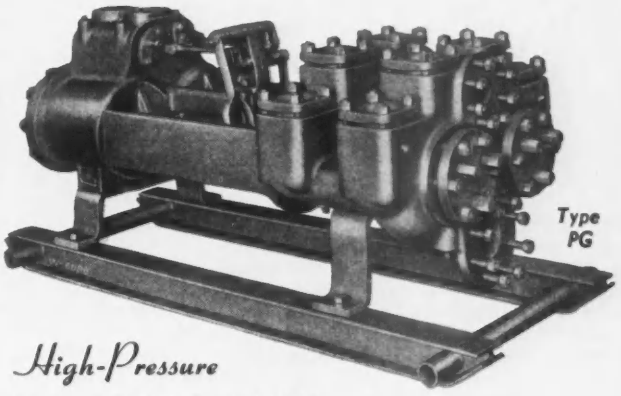

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west of Mineral field. On potential the well flowed 165 barrels of 41.2-gravity oil daily through 9/64-inch choke with tubing pressure 1050 pounds, casing pressure 1300 pounds, and gas-oil ratio 750/1. Total depth is 8500 feet with 7-inch casing set to 7615 feet and perforated at 7483-93 feet in the Slick sand for completion. The Mineral field east of this discovery produces from the Slick sand but makes only gas and condensate. The Yoward 1 tested salt water on drill-stem tests of the Luling sand, topped at 7628 feet, and the Massive Wilcox.

Calhoun County: Ryan Consolidated Petroleum Company's Theresa H. Wagener 1, wildcat 2 miles east-northeast of Green Lake townsite and slightly less than 3 miles southwest of Sheriff field, has shown for production. From perforations at 5977-92 feet the well swabbed at the rate of 2 barrels of oil per hour. These perforations have been squeezed and tests were being made of perforations at 5926-42 feet. Total depth is 6097 feet with 5½-inch casing set on bottom. This well is in Tract 2, Block 1, Green Lake Farms.

Goliad County: W. L. Goldston's Jennie Ray Kauffman 1, deep Wilcox test at Hord's Creek field, is being completed as a gas-condensate producer. A drill-stem test at 7900-20 feet flowed gas and condensate with no gauge and completion is being made at this interval. Total depth is 8600 feet with 7-inch casing set to 8246 feet. Previous production in this field was from the Yegua at the 4500-foot level.

Victoria County: Barnsdall Oil Company has deepened W. H. Bennett 8 at Heyser field and completed it in a new pay zone. Old total depth was 5750 feet and the well has been deepened to 8010 feet and completed in the new pay, perforated at 7481-93 feet. No gauge of production had been made but a drill-stem test at this interval with 800 feet of water cushion, open 30 minutes, flowed the cushion in 12 minutes with 2600 pounds working pressure, then flowed gas with 2700 pounds working pressure.

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• Upper Texas Coast

Liberty County's Hankamer Area Yields New Deep Pay

New deep pay discovered at Hankamer; second well completed at North Vidor; Sun completes South Call area discovery; wildcat off Humble dome's east flank shows gas-condensate; Old Ocean production extended 2200 feet southwest.

Liberty County: A deep pay discovery for the Hankamer field is Gulf Oil Corporation's E. W. Boyt 29, in the northeastern part of the field in Amos Allen Survey, Abstract 562. From perforations at 7110-22 feet the well flowed on potential 164 barrels of 35.3-gravity oil daily through ⅛-inch choke with 1000 pounds flowing pressure on the tubing and gas-oil ratio 200/1. Total depth is 7347 feet with 5½-inch casing set to 7331 feet. This producing depth is approximately 1600 feet lower than previous deep production that came from just above the 5500-foot level.

Orange County: Gulf Oil Corporation's Miller-Vidor Land Company et al 1, second well in the North Vidor area and 3845 feet east-northeast of Hinkle's Miller-Vidor 1 discovery, has been completed as a gas-condensate well and shut in with no gauge taken. Total depth is 8010 feet with 5½-inch pipe cemented to 6992 feet and perforated at 6932-34 feet for completion. This is a new upper sand for the field, the discovery well having been completed from perforations at 7772-78 feet.

Newton County: In the South Call area Sun Oil Company has completed E. S. White et al 1 as a discovery. Located about 3 miles northwest of the Sabine Tram field, White 1 flowed on potential 35.9 barrels of fluid daily, 37 percent water and the remainder 48.7-gravity oil. Flowing pressure on the tubing was 1050 pounds and gas-oil ratio 7166/1. Total depth is 11,002 feet with 5½-inch casing set to 10,749 feet and perforated for completion at 10,642-56 feet.

Harris County: Houston Oil Company of Texas' Eugene L. Bender Estate 1, wildcat 3 miles off the east flank of Humble dome, has indicated gas and condensate production. A drill-stem test at 7786-96 feet flowed gas and condensate with 1000 pounds pressure. Condensate was recovered on pulling the tool. Hole was drilled below 7800 feet following this test.

Brazoria County: Tide Water Associated Oil Company & Stanolind Oil & Gas Company's Harding 3 has extended production at Old Ocean field 2200 feet southwest. On potential the well flowed 305 barrels of 37.4-gravity oil daily through 3/16-inch choke. Flowing pressure on the tubing was 1150 pounds. Total depth is 11,100 feet with casing perforated at 10,100-60 feet for completion.

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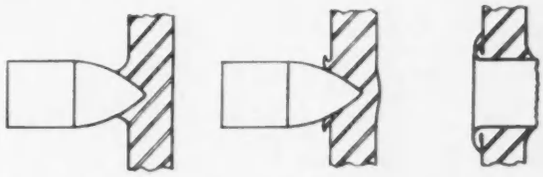

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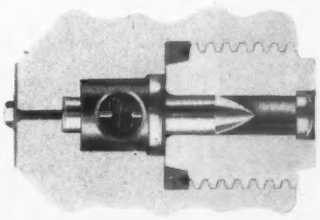

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• South Louisiana

Wildcat in Iberia Parish Reperforated for New Test

Tigre Lagoon wildcat reperforates for test; good producer finaled at Venice; ¼-mile outpost at Delta Duck completed; deep Queen Bess Island test drilling below 14,174 feet; Shell abandons Jeff Davis Parish wildcat.

Iberia Parish: Union Oil Company of California's P. O. Landry 1, wildcat in 29-13s-5e on the Tigre Lagoon Prospect, has been reperforated at 11,480-500 feet after squeezing original perforations in an attempt to shut off a 20 percent water cut. Total depth is 11,843 feet with 7⅝-inch casing set on bottom. An initial test of perforations at the completion interval flowed gas and condensate with 3600 pounds flowing pressure, 3900 pounds shutin pressure, and the salt water cut.

Plaquemines Parish: Tide Water Associated Oil Company's Manhattan Land & Fruit Company 2-D, at Venice field in 22-21s-30e, has been completed for a potential of 333 barrels of 30.2-gravity oil daily through 10/64-inch choke. Tubing pressure was 2100 pounds and gas-oil ratio 1072/1. Total depth is 11,812 feet with 5½-inch casing set on bottom and perforated for completion at 11,565-595 feet.

The Texas Company's State-Delta Duck Club 20, ¼-mile south offset to production in the Delta Duck field and in 6-21s-20e, has been completed. On potential the well flowed 195 barrels of 35.9-gravity oil daily through 9/64-inch choke with 1300 pounds flowing pressure on the tubing and gas-oil ratio of 600/1. Total depth is 9808 feet in salt topped at 9749 feet. Seven-inch casing is set on bottom and perforated at 8148-84 feet for completion.

Jefferson Parish: The Texas Company's Lafourche Basin Levee District 1, wildcat 1¼ miles west of State 1, gas well at Queen Bess Island field, is below 14,174 feet. The test has 8⅝-inch protection casing set to 12,004 feet with no shows reported.

Jeff Davis Parish: Shell Oil Company has abandoned as dry Long Bell Petroleum Company 1, wildcat 4 miles west of Indian Village field. This well blew out at 8244 feet and stuck drill pipe. Hole was then plugged back and sidetracked at 4700 feet. A drill-stem test at 8244-47 feet in sidetracked hole showed gas and salt water. Total depth is 8731 feet.

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• North Louisiana

Bienville Parish Wildcat Swabs New Travis Peak Perforations

Bienville wildcat swabs new perforations in Travis Peak; Shell continues core tests on Frost Fee, Union Parish; Winn deep wildcat below 10,568 feet.

Bienville Parish: Lion Oil Company's L. E. Ozley 1, C SW NE 13-17n-6w, was perforated with 180 shots from 10,090-120 feet in the Travis Peak and Was swabbing to test. A previous test at 10,680-737 feet, after treatment with 4000 gallons of acid, yielded 100,000 cubic feet of gas per day before plug was set to 10,158 feet. Total depth is 10,744 feet.

Franklin Parish: Big Chief Drilling Company and Glasscock Drilling Company were preparing to core around 3725 feet in the wildcat, D. Slack 1, NW SW 1-15n-7e, having drilled to 3629 feet in the Tuscaloosa. No commercial shows have been found.

Union Parish: Shell Oil Company has asked for permit to drill Frost Lumber Company 5, C SW NE 31-23n-2e, as a Comanchean core hole test. Frost 2, C SW SE 14-22n-1w, was completed at 3250 feet, with a reported 12 feet of saturated sand around 3100 feet that set off an active leasing campaign in the area. Information has not been released by the operators, who are exploring a large block of the Frost fee on which geophysical option is held.

Winn Parish: Stanolind Oil & Gas Company's Tremont Lumber Company 1, C NW SW 20-12n-1w, deep wildcat, was drilling at 10,568 feet, without shows.

De Soto Parish: Skelly Oil Company's wildcat Thelma Nash 1, SW NE 20-12n-16w, which had shows indicating possible oil production on the north flank of the Logansport field, is below 7080 feet.

Red River Parish: R. O. Roy and British American Oil Development Company's wildcat Trixie Wimberly 1, SE 2-13n-10w, is drilling below 5906 feet, but has reported no commercial showings.

• Michigan

Two Weeks Test Establishes Newaygo Well as Discovery

Michigan Devonian Petroleum Company's Corey 1, NE SW NE 16-16n-11w, Newaygo County, 10 miles southwest of the Reed City oil field, has pumped from 60 to 90 barrels of oil and 2 to 8 percent water in a 2 weeks' test to establish it as a discovery. Outpost is producing from Traverse lime at 3080-98 feet.

Sun Oil Company recompleted Anderson 1, NE NW NW 14-12n-13w, southeast offset to the Kimball Lake pool discovery, was in Traverse at 2365 feet after losing the bottom part of the hole when nitro shot collapsed 5-inch casing. Lower zone from 2884-2905 feet, Reed City Monroe section, showed 57,000 cubic feet of gas before shot and never was tested after the shot. The well produced up to 160 barrels oil an hour from Traverse pay section after a 500-gallon acid shot.

Midland County: Collin and Whitney's O'Dell 1, S½ SE NW 7-15n-1w, Jerome township, averaged 15 barrels of oil per day pumping after 1000-gallon acid shot to Dundee limestone pay at 3743-48 feet and will be retreated after cementing 5-inch casing.

State Lease Auction: Lands Division, Department of Conservation, will offer 69,000 acres of wildcat lands for leasing at a 2-day sale in Lansing, May 1 and May 2. It is the biggest offering made by the state in 3 years.

Wants

We still hear too much about freedom from want. Most of it comes from well meaning people whose hearts bleed for the poor "unfortunates," but the idea stems from the isms. As Arthur H. Motley has so ably pointed out, wants have made America great. The Arab wants nothing better than a dirt floor for his kids and goats, so he lives that way. In America we want cars, refrigerators, radios and bath tubs. We need them no more than the Arab, but we are willing to work like hell to get them. As a result, only 10% of our people have incomes of $1,000 or less. Let's not have too much freedom from want. It motivates everything that is free and democratic, including the oil industry.

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• Oklahoma

Seminole City Flank Yields New Calvin Sand Production

New Calvin sand production being developed on east flank of old Seminole City field; Sinclair Prairie adds 44th producer to Southwest Antioch pool; Gulf seeks to flood sand in Garcreek pool; Fourdee pool successfully extended eastward; new gas pool opened in Comanche County; East Lindsay pool extended southeast; new Booch sand field near Holdenville apparently extended southward.

Seminole County: Development of new Calvin sand production on the east flank of the old Seminole City field, on a spread of 300 acres, is continuing by F. G. Fox and W. J. Fox, Oklahoma City independent operators. Deese 2, SE NW SE 25-9n-6e, was making 100 to 105 barrels of oil a day on flow through casing while cleaning out from the upper Calvin sand, perforated at 2350-65 feet and based at 2390 feet. The well was drilled to total depth of 4092 feet in the Hunton lime, and missed the Cromwell sand. Water was found in the Hunton. Deese 1, which was drilled to the Hunton and temporarily abandoned, will be worked over. James 1, SW NE SE 25-9n-6e, topped Calvin at 2350-82 feet, and when pipe was set on top, tested an estimated 3 million cubic feet of wet gas. The test was deepened to find water and has been cemented off and shut down.

Antioch Area: Sinclair Prairie Oil Company has added the 44th producing well to the Southwest Antioch pool of Garvin County, and has extended production a location west on the north side of the pool. Hays 1, NW SW SE 18-3n-2w, flowed 469 barrels of oil through ½-inch choke in 24 hours on completion test. Total depth is 6674 feet, with pay zone perforated at 6494-548 feet.

Garcreek Area: Gulf Oil Corporation, discoverer of the Garcreek field and larger interest holder in the area, has petitioned the State Corporation Commission for permission to repressure by water-flooding 500 acres of leases in the field. Hearing has been set for May 20 at Oklahoma City. Gulf plans a central input well on the 500-acre spread, including the NE NE, S½ NE, and E½ SE of Sect. 18, and NW and S½ NW of Sect. 17, NE NW and N½ NW NE of Sect. 17, NE SW of Sect. 17, and W½ SW SW of Sect. 17, the E½ SW SW and SE SW of 17-10n-7e. Remaklus 1, SW SW NW 17-10n-7e, was discovery well of the field, with an initial production of 1101 barrels daily from the Gilcrease sand from 3726-49 feet. Remaklus 3 is producing gas-distillate from the Cromwell sand. The field is producing an estimated 350 barrels of salt water with the oil, and the company proposes to inject this into the Gilcrease zone, later stepping up the input to about 500 barrels daily.

Noble County: The new Fourdee pool has been extended ½ mile east by British American Oil Company's Will 1-B, SE NW SE 20-22n-1w. The well flowed 196 barrels of oil in 4 hours through open tubing from perforations in the Mississippi lime at 4776-836 feet, and is now shut in for tankage. Total depth is 4986 feet with 5½-inch casing set at 4908 feet.

Comanche County: A new gas pool has been opened by Texola Drilling Company, north of the Fort Sill military reservation. Tas-Saw 1, SW NE SW 24-4n-11w, gauged 10,705,000 cubic feet of gas per day at total depth of 1761 feet on a recent test, with 5½-inch casing set on bottom. The test was drilled by Texola on a farmout from Shell Oil Company. It lies in an area where several major companies have done considerable leasing at state and Indian sales. Nearest production is in the Fort Sill pool, a number of miles to the southeast.

Garvin County: Max Pray and R. L. Bauman have extended the East Lindsay pool 1¼ miles southeast with Hinkle 1, CNW SW 6-4n-3w. Although situated more than the usual ½ mile for extensions, the test is believed on the same structure as wells producing from the main field. A total of 2730 feet of free oil and 1390 feet of oil- and gas-cut mud was recovered on a drill-stem test in the Upper Bromide from 9911-10,030 feet. Flow was estimated at 50 to 60 barrels of oil per hour, with flow pressure 2200 pounds, and bottom-hole pressure 4400 pounds. The operators' Frankenberg 1, southeast of the Hinkle, recovered 180 feet of free oil on a drill-stem test at 9795-9847 feet.

Hughes County: A new Booch sand field, recently opened, apparently has received an extension ½ mile south. W. L. Pickens and Guy Bughner's Bilby 1, SE SE NW 31-8n-9e, swabbed at the rate of 75 barrels of oil per day before shooting with nitroglycerine. Booch was topped at 2779 feet, with pay from 2779-2810 feet, total depth. The operators hold about 1200 acres of leases around the new well, and have staked Bilby 2, SW SE NW 31-8n-94; Bilby 3, SE SE NW Sect. 21; King 1, SW SW NE Sect. 31; and Witty 1, NW NW SE Sect. 31.

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• Kansas

Area Opened Northeast of Ryan Pool in Rush County

Rush County wildcat opens oil pool; Pawnee County well apparently opens gas pool; pool opener in Stafford County tested; wildcat completed for 194 barrels daily; attempt to extend Boyd pool production fails.

Rush County: An oil pool has been opened 2 miles northeast of the Ryan pool by Solar Oil Company's Tammen 1, SW SW SW 24-19s-16w. The well was swabbing and flowing 120 barrels of oil per day from the Arbuckle lime from 3654-98 feet, total depth. Arbuckle was topped at 3654 feet, and on a drill-stem test from 3654-67 feet, with tool open 15 minutes, 24 feet of gas-cut mud was recovered. Casing was set to 3661 feet. Gas estimated at ½ million cubic feet a day was gauged through perforations from 3654-98 feet.

Pawnee County: A gas pool apparently will result with J. M. Huber Corporation et al's Torrance 1, SW SW SW 19-21-15w, 4 miles south of the new Ash Creek pool. On a drill-stem test at 3843-54 feet in the Arbuckle lime, 2 million cubic feet of gas was recovered.

Stafford County: Testing continued at J. M. Huber Corporation's O'Connor 1, CNW NW 16-24s-15w, between the Macksville and Farmington pools. The well apparently will open a new gas pool when completed. Tubing was being run to acidize after an initial gauge of 5 million cubic feet of gas. Pay is from the Arbuckle lime, topped at 4061 feet, with total depth 4063 feet.

Penny-Wann Area: The state's 16th oil pool for the year has been brought in by Darby & Bothwell, Inc.'s Weitzel 1, SW SW NW 1-16s-20w, 3½ miles south of the Penny-Wann pool, Rush County. The well was completed for 194 barrels of oil per day on pump from the Gorham sand, with total depth 3769 feet. The pool has been named "Weitzel-Gorham" by the nomenclature committee on oil field names.

Barton County: An attempt to extend production of the Boyd pool ½ mile east has met with failure. Keyes Drilling Company et al's Eveleigh 1, SE SE NE 2-19s-14w, has been abandoned at total depth of 3374 feet in the Arbuckle lime, topped at 3339 feet.

Spacing Application Dropped

The Oklahoma Corporation Commission, on motion of applicant, dismissed the long-pending application of The Carter Oil Company for establishment of 160-acre well spacing for development of oil production in the Washington pool of McClain County.

• Arkansas

Outpost in Spirit Lake Field Has Oil and Water on Tests

Spirit Lake outpost tests new perforations for oil and water; good producers completed for Patton and Wesson fields; northeast limit of East McNeil field defined.

Lafayette County: Magnolia Petroleum Company's southwest outpost to the Spirit Lake field, Lester Brothers 1, C NW NE 22-16s-25w, retested perforations after acidizing from 3915-35 feet, squeezed, and reperforated from 3682-90 feet. These perforations are reported to have tested oil and water. Total depth is 5467 feet.

McAlester Fuel Company's wildcat C. Lee A-1, C NE SW 24-17s-24w, 7 miles south of Lewisville, is below 5638 feet. Massive Anhydrite was topped by samples at 4360 feet.

Barnsdall Oil Company completed a good producer in the Patton field, Wellman 1, C SW NW 33-17s-24w, which flowed 305 barrels of 45.2-gravity oil per day through 7/32-inch choke from the Smackover lime at 9280-87 feet. Total depth is 9302 feet.

Ouachita County: McAlester Fuel Company's A. C. Wesson A-1, C SE SE SE 23-15s-19w, also was a good producer for the Wesson field. The test was an open hole completion at 3142-60 feet, flowing 293 barrels of oil daily.

Columbia County: Atlas Oil & Refining Company's L. M. Doss 1, C NE SW 8-16s-19w, a failure, has defined production limit of the East McNeil field to the northeast. It was abandoned at 3820 feet.

• Mississippi

Carthage Point Field Well Is Nearing Producing Level

Carthage Point well nears producing zone below 10,060; core tests made in Jones County deep wildcat.

Adams County: The Pure Oil Company's L. S. Stanton 1, 11-6n-3w, which is undertaking to extend production 1 mile east in the 3-well Carthage Point field, is drilling below 10,060 feet within a few feet of the field's producing zone. No shows have been reported in the Wilcox but the well is being watched with interest in view of the present heavy production of the discovery, which is making a daily average of 515 barrels of condensate. In the Cranfield field Texas-Pacific Coal & Oil Company's R. G. Calcote 1, 28-7n-1w, ¼ mile east of production, is running into considerable trouble with salt water from the field's oil-producing zone in the lower Tuscaloosa. The well, which lies on the fringe of the zone, was perforated at 10,286-304 feet and was flowing about 3 barrels of fluid an hour of which only 2 percent was oil. Testing continued. In the LaGrange field Texas-Pacific's O. L. Wilson 3, 8-6n-2w, which had previously shown excellent possibilities of developing a new gas producing zone in the upper Wilcox at 4618-34 feet, is drilling below 5437 feet with no new shows reported.

Lincoln County: Rogers Lacy's Harvey Smith 1, SE NE 17-6n-7e, wildcat is drilling below 8485 feet in a drive to the 10,000-foot zone. No shows have been reported.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, potential pool opener, was running core tests below 11,320 feet. Cores from 11,266-71 feet recovered medium-grained asphalt oil sand. Cores at 11,271-80 feet developed medium porosity spotted with very heavy oil. Cores between 11-280-303 feet were unproductive.

Jefferson County: The Ohio Oil Company's Hard Times Plantation 1, NEc 35-8n-1w, 10,000-foot test, is drilling below 9127 feet below chalk section. Slight stain and odor have been reported up the hole in Wilcox zone, but no shows have been noted below that point.

Forrest County: The Superior Oil Company's Maria Draughn 1, NEc 12-3n-13w, deep wildcat, is drilling below 11,021 feet. No shows have been announced. No new information has been released on Superior's Cassie Bradford 1, SEc SW NW 1-3n-13w, which was shut down several months ago at a total depth of 15,550 feet after being rumored to have made commercial production.

Marion County: Humble Oil & Refining Company's C. Tullos 1, wildcat in SWc 12-1n-18w, which had reported shows in the Tuscaloosa at 9027-37 feet, was running core tests below 9937 feet. No shows have been reported in the last several hundred feet.

Florida

Humble Oil & Refining Company's Gulf Coast Realty Company 9, C SE¼ 24-48s-29e, Sunniland field, of Collier County, has indications of fair commercial production as it continues to swab oil with 13 percent wash water. Production is from perforations at 11,566 feet. Humble's Gulf Coast Realty 5, SW SW 20-48s-30e, is drilling below 10,886 feet.

Humble's wildcat, Lee Cypress Company 3, SE SE 28-47s-29e, is continuing below 11,706 feet. Slight shows of oil were recovered in cores at 11,627-33 feet. Cores at 11,633-38 feet developed anhydrite.

Clay County: Humble's Foremost Properties 1, NE SW 4-6s-25e, took cores from 2535-2890 feet and recovered dolomite, chalk and anhydrite with no shows indicated. Protective string was cemented at 2917 feet and drilling is now below 3505 feet.

Alachua County: Tide Water Associated Oil Company's Josie Parker 1, C NW SE 33-7s-19e, is a new wildcat location 15 miles northwest of Gainesville. The company abandoned J. A. Phifer Estate 1, SW NE 24-9s-21e, at 3228 feet.

• Illinois Basin

Kenner West Pool, Illinois, Is Given New Pay Horizon

Kenner West pool, Clay County, Illinois, gets new pay horizon; McClosky production added to North Kenner pool, Clay County; Effingham County pool opened.

Illinois

Phillips Petroleum Company's Randall 1, SW SW NE 23-3n-5e, Clay County, is giving the Kenner West pool a new pay horizon. In initial pump tests, the well yielded 241 barrels of oil natural in 24 hours from Cypress sand at 2560-75 feet, and the Bethel sand at 2705-15 feet. The latter pay is a new producing zone for the field.

National Associated Petroleum Company's Theobold 4-A, NW NW SW 17-3n-6e, has added McClosky lime production to the North Kenner pool which originally produced only from Bethel sand. During initial pump test the well made 308 barrels of oil in 24 hours from the lime at 2965-70 feet.

Perry Fulk's Thompson 1, 26-2n-7e, apparently will extend the Clay City Consolidated pool after making gas in

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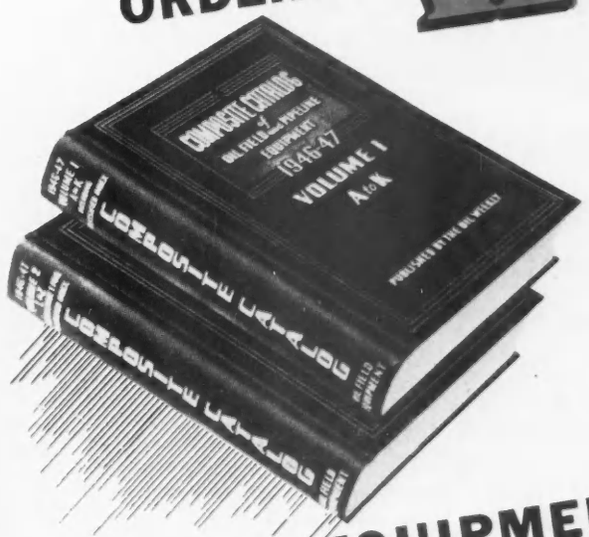

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8 minutes and flowing oil in 20 minutes during a drill-stem test.

Effingham County: Gulf Refining Company's Schultz 1, SW SW NW 32-7n-7e, 5 miles north of the Bible Grove pool, has opened the Elliottstown pool with production from Rosiclare at 2730-38 feet. In early pump tests the well made 84 barrels of oil in 24 hours and 62 barrels of oil the second 24-hour period. The well was given 1000 gallons of acid.

Richland County: Harry Evans' Provine 1, W½ NE NW 3-2n-14w, is a prospective mile northeast extension for the Parkersburg Consolidated pool. During a 1-hour drill-stem test of McClosky lime at 3118-28 feet, the well gassed in 7 minutes and made 300 feet of oil.

• Ohio

Sayre Pool, Perry County, Gets Large Gas Extension

Sayre pool gets large gas extension; gas found west of Clayton; Deerfield area is disappointing; Clinton gas found in Salt Creek; large oil well in western York likely.

Perry County: F. R. Beasley has drilled in a 3¼-million cubic foot well at John Reed 1, SW SW 23, Bearfield township and ⅓ mile northeast of Jesse Kitchen 1. This is the largest open flow of any well yet reported in the Sayre pool, and the rock of 1150 pounds is virgin pressure for this area. Top of the Clinton was reached at 3885 feet and drilled to 3908 feet. In prospecting along the west edge of the Clayton pool, Petroleum Drilling Company drilled through the Clinton sand on the Bert Wilson 2, NE SW 12, Reading township, with an open flow of 400,000 cubic feet of gas and a show of oil. The sand was logged at 3114-58 feet.

Morgan County: The Ohio Fuel Gas Company's E. E. Price 1, SW NE 22, Deerfield township, reported no shows in either the Clinton or Medina sands, and it is probable the company will abandon this area. The record now is 2 small gas wells and 3 dry holes in the deep sands.

Muskingum County: B. G. Davis et al struck gas in the Clinton at W. J. Shook 2, NE SW 33, Salt Creek township, and it will be produced before drilling on down to the Medina. Drilling was stopped at 4235 feet, 24 feet in the sand, where the gauge was 1¼ million cubic feet.

Morgan County: Industrial Gas Corporation and Clyde Foraker drilled in Fred Rambo 2, SW SE 22, York township, with an unusually good showing of oil. The Clinton, reached at 3800 feet, started to pay at 3820 feet and continued to increase until the bottom was reached at 3834 feet. After 18 hours the oil had filled the hole over 2800 feet. The well is to be shot and tubed.

Symposium Planned

Geologists from the Eastern U. S. are expected to attend the Ordovician Symposium to be held in Pittsburgh May 16 under the auspices of the Pittsburgh Geological Society. Ten papers by authorities on the Appalachian Basin will contain information on the Trenton and Sub-Trenton rocks. All sessions, and the banquet to be held in the evening, will take place in the Cardinal Room of the Hotel William Penn. F. C. Hauber, 545 William Penn Place, Pittsburgh 19, is taking reservations.

Alabama Board Meets

Rules and regulations and well spacing for the Gilbertown field, Choctaw County, were discussed at a meeting of the Alabama Oil and Gas Board in Birmingham April 24.

• California

High-Gravity Oil Discovery In Ventura County Confirmed

Important discovery of high-gravity oil made on Oxnard Plain in Ventura County; Northeast Coalinga field extended ¾ mile north; Paloma production extended ¼ mile northeast; minor discovery made between Edison and Mountain View fields; seventh producing zone discovered in Del Valle field.

Ventura County: Confirming a report by THE OIL WEEKLY last week, Standard Oil Company of California has announced the discovery of a new oil field on the Oxnard Plain near the mouth of the Santa Clara River and about 1¼ miles from the coast. McGrath 2, in 26-2n-23w, on a 24-hour production test flowed 242 barrels of 44-gravity clean oil through 14/64-inch choke with 2800 pounds flow pressure. Gas-oil ratio is 8100. Production is from the Repetto formation in Lower Pliocene. Productive intervals are 8428-73 feet and 8632-60

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feet. Drill pipe with a packer is hung inside a stub liner to make a full string with 2-inch tubing run inside the drill pipe.

The discovery is undoubtedly important. It culminates a search covering the last 25 years during which many unsuccessful wildcats were drilled. Extensive seismograph and core drill tests have been made by Standard of California and others. Standard also has made extensive magnetometer surveys. The discovery is about 7 miles south of the prolific Ventura Avenue field and about 5 miles northwest of several heavy oil wells which have been producing about 10 years in the Oxnard area. Standard has staked a second well about 2500 feet southeast of the discovery.

Fresno County: Sharples Corporation has extended the Northeast Coalinga field ¾ mile north. On a production test of the interval 8240-320 feet, the well flowed between 250 and 300 barrels of 25-gravity oil and preparations were being made to complete. Production is believed from the Gatchell equivalent. There are 7000 acres in the play with Sharples acting as operator and holding a one-half interest, and Kirk Oil Company of Frannie, Wyo., and Ed Pauley of Los Angeles a quarter interest each. A second well will be drilled immediately, but location has not been announced. Discovery well is in 6-19s-16e. Total depth is 8900 feet with plug at 8380.

Kern County: General Petroleum Corporation has extended the Paloma field about ¼ mile northeast. On a formation test of Tupman 19-36, in 36-31s-26e, with only 4 feet of formation open, the well flowed 1200 barrels of 28-gravity almost clean oil through a 48/64-inch choke. The choke was gradually reduced to 13/64-inch when the well flowed 378 barrels in 18 hours. Result of the test was unexpected as the location was hardly considered in the money. It is about 2200 feet from production. Sand tested is between 11,920-24 feet. Operator will take in more of the sand before completing.

Union Oil Company has made a small discovery southwest of the Edison field and northeast of production in the Mountain View field in 28-30s-29e. Porter 74-28 was completed from the Santa Margarita formation pumping 66 barrels of 23.2-gravity oil, cutting 2 percent.

Seaboard Oil Company's Bacon Hills discovery, Seaboard-Bandini 3-21 in 21-28s-20e, should be back on production soon. The well came in flowing about 500 barrels of 38-gravity oil but after a short period began making all water which was assumed to be coming from above the Oceanic oil zone. A squeeze job through 4 holes at 7780 feet was expected to remedy the condition. Producing interval is 7846-76 feet.

Los Angeles County: R. E. Havenstrite, Operator, was believed to have discovered a new deep producing zone in the Del Valle field. Lincoln 15 in 16-4n-17w was reported to have logged considerable oil sand with top at 10,140. Drilling is proceeding below 10,500 feet. There are at present 6 commercial producing zones being developed in the field. The lowest is the Bering zone, also discovered by Havenstrite. Producing interval in the discovery well was 7900-8065 feet. The new zone may be the equivalent of 1 of the producing zones in the Oak Canyon field to the north, several of which are lower stratigraphically than the deepest producing zone at Del Valle.

Shell Oil Company is grading location for a wildcat, Union 1 in 12-3s-14w, about 1 mile northwest of production in the Athens field. The land is owned in fee by Union, but this company is not participating in the drilling of the well. The area has been well prospected, but it is understood this will be a deep test. Shell's wildcat on the north flank of the Long Beach field, Dolley 2 in 29-4s-12w, is drilling below 9600 feet.

Orange County: Southern Belle Oil Company's deep test in the old Huntington Beach field, Rex 12, will be abandoned. Apparently due to a water condition, commercial production could not be obtained. It is understood that another well will be drilled in this area by a different operator.

• Rocky Mountain Area

Herrick Dome, Wyoming, Test Fails in Casper Formation

Superior's second test of Herrick Dome, Wyoming, is failure in Casper; drilling halted in Antelope wildcat, Fremont County; Colorado's Powder Wash field has apparent extension.

Wyoming

The Superior Oil Company's second test of the Herrick Dome structure, Albany County, 10 miles west of Laramie, is a failure in the Casper formation. The well is Herrick 2, SW SE SW 1-16n-76w, ⅜ mile southwest of the discovery, completed 2 months ago. Her-

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■ 5 Complete Reda Pumping Units. Cables like new, 75 and 97 H.P. Motors. Max Steinbachel, 1905 Park Place, Wichita 4, Kansas. Phone 5-6082.

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rick 2 found the Casper at 3625 feet, more than 100 feet lower than the discovery well. After casing was run and perforated the well made water from 3 zones in the Casper, which had shown oil saturation when the well was drilled. Location has been made midway between the dry hole and the discovery well for a third test. Failure of the second well definitely establishes that the productive area will be extremely small.

Fremont County: General Petroleum Corporation has stopped drilling on its Antelope wildcat, No. 45-25-G, NE NE SW 25-27n-94w, north side of the Red Desert Basin. This well was drilled to 10,776 feet, total depth, in the Nugget formation but all formations encountered were reported hard and tight. Casing will be run for a test of the Lakota sand at around 10,100 feet, where as gas show was reported. This well is 10 miles southwest of the Crooks Gap field, which produces from the Lakota sand, and definition of the structure was made by seismograph 2 years ago.

The projected Madison test being drilled by Stanolind Oil & Gas Company at Terry 3-M, NW SW SW 19-2s-2e, Hudson field, may be completed at its present depth. The well is flowing approximately 75,000 barrels of fresh water daily with approximately 3000 barrels of 22-gravity oil and the operator may decide to install a treating system to recover the oil percentage. This is the first test below the top of the Tensleep sand, which produces in other wells in the field. The well blew out 3 weeks ago when it encountered the strong water flow from the base of the Tensleep at 1866 feet, total depth. Casing was run as soon as the well was killed, but when plug was drilled the well again started flowing water with the oil. The field was discovered in 1909 and produces approximately 200 barrels of 23-gravity oil daily from the Embar and Tensleep formations.

Washakie County: At South Fork, in the southern end of the Big Horn Basin, General Petroleum Corporation's discovery was pumping approximately 280 barrels of 30-gravity oil daily. The well is No. 88-24-G, SE SE SE 24-46n-92w, and was drilled to 10,900 feet, total depth, before plugging back to test the Embar between 10,046-1100 feet. The well was acidized with 2000 and 5000 gallons and will probably be reacidized with an additional 10,000 gallons. Of interest in connection with this operation is the fact that gas produced with the oil is sweet, whereas that produced in the Worland field, 15 miles north of South Fork, and Neiber Dome field, 10 miles southwest, has a very high hydrogen sulfide content. Also, the gas-oil ratio at South Fork is much lower than in the other 2 fields. The Worland and Neiber Dome fields produce from the Embar formation.

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■ FOREIGN POSITIONS: Junior Engineers, Material Men, Material Accountant, Payroll Clerks, Field Auditors, Warehouse Clerks, Geologists, Draftsmen, Male Stenographer-Clerks, Diesel Mechanics. These positions and many more are now opened for experienced applicants. Prefer single men. Fee paid by employer. Mail your resume to: CHAS. J. LOVELESS PERSONNEL SERVICE, 508 MAYO BUILDING, TULSA, OKLAHOMA.

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■ 335 ACRES located in heart of New Caddo and Ellenburger production in Southwestern Stephens County, Texas. Will consider developing proposition. J. M. Rush, Box 271, Waco, Texas.

Colorado

Sprecher Drilling Company of Casper has drilled to 5225 feet, total depth, on the mile east extension to the Powder Wash field, Moffat County, along the Colorado-Wyoming line. Casing will now be run to test a sand encountered between 4586-4600 feet. This zone made more than 500 feet of oil on drill-stem test when the well was drilled, and the well apparently will extend the productive limits of the field. Production in this field is from sands in the Wasatch (Tertiary) formation. The test is in SW SW NW 34-12n-97w.

Utah

Pacific Western Oil Company's Gordon Creek wildcat at Unit 1, C SE NE 24-14s-7e, Carbon County, has been whipstocked at 9100 feet and is drilling below 9160 feet. The test was started last fall and considerable difficulty has been experienced with lost circulation and mechanical troubles. Three weeks ago drill pipe was stuck below 9100 feet and the operator was unable to free the pipe. This test is now in the Navajo section and is scheduled to go below 10,000 feet. This is the first deep operation in this section of Utah and has now established a depth record for the state.

Emery County: Rig has been skidded ½ mile north for a new test on Mountain Fuel Supply's South Last Chance block. Unit 1, NW SE SW 18-26s-7e, has been plugged back to 1100 feet and completed as a water well after hole was lost at 3500 feet, total depth, due to stuck drill pipe. The well was in Coconino formation, topped at 3038 feet, with total depth at 3500 feet. This test was scheduled to test Pennsylvanian beds at around 4000 feet, and the new well is projected to the same depth.

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Morgan County: D. I. McNabb-C. P. Mayhall's Bramlett 1, nwc nw se 7-8s-4w, abnd 4-2-47 at 2115.

CALIFORNIA WILDCATS

Los Angeles County: Standard's Six Companies Fee 3, 2-3s-14w, El Segundo area, abnd 4-13-47 at 7274.

San Luis Obispo County: E. B. Hall and Co.'s Mahoney 36-2, 2-25s-12e, San Miguel area, abnd 4-14-47 at 3405.

Ventura County: Richfield Oil Corp.'s Saticoy 1, 22-3n-21w, West Mt. area, abnd 4-16-47 at 3406.

COLORADO WILDCAT

Logan County: C. A. Greenawalt's Giocomini 1, c sw ne 13-9n-52w, Padroni area, abnd 4-14-47 at 1000.

ILLINOIS WILDCATS

Washington County: Chicago Pet. Corp.'s Thompson 1, nw ne nw 23-3s-4w, abnd 1226.

Wayne County: Robinson & Puckett's Williams 1, ne se sw 24-2n-8e, abnd 3129.

White County: Nation Oil Co.'s Rudolph 1, nw ne nw 10-5s-10e, abnd 3163.

N. V. Duncan's Hunt 1, se ne nw 19-5s-11e, abnd 3108.

INDIANA WILDCATS

Martin County: Hoosier Pipeline Corp.'s Kerns 1, 9-3n-4w, abnd 420.

Posey County: Vic & Van Operating Co.'s Carr 2, se se sw 29-4s-13w, abnd 2264.

KANSAS WILDCATS

Barber County: J. M. Huber Corp. et al's Peckenpaugh 1, sw sw ne 34-32s-14w, abnd 5336.

Gray County: Cities Service's Snyder 1, c nw se 18-28s-28w, abnd 6445.

Greenwood County: Delbert Mossman's Holland 1, sw ne sw 24-23s-11e, abnd 2665.

Kingman County: Phil-Han Oil Co. et al's Albritten 1, sw sw sw 6-29s-10w, abnd 4712.

Russell County: C. W. Trickett et al's Bochman 1, c s½ s½ nw 35-14s-12w, abnd 3355.

Sedgwick County: Texas Co.'s Devine 1, ne ne se 11-28s-2e, abnd 3356.

NORTH LOUISIANA WILDCATS

East Carroll Parish: Stanolind's Chicago Mill & Lbr. Co. 2, c sw se 4-18n-11e, abnd 4-12-47. TD not reported.

Union Parish: Shell's Frost Lbr. Co. 2, c sw se 14-22n-1w, abnd 3-14-47 at 3250.

SOUTH LOUISIANA WILDCATS

Jeff Davis Parish: Shell's Long Bell Pet. Co.'s 1, 33-7s-7w, 4 mi w Indian Village, abnd 4-5-47 at 8731.

St. Charles Parish: Union of Calif.'s George Montgomery 1, 4999.7 n 2381.6 e of s cor 85-12s-19e, 3 mi wly fr Hahnville disc, abnd 4-15-47 at 10,985.

OKLAHOMA WILDCATS

Beaver County: Gulf's Mindenhall 1, c se sw 21-4n-20eCm, abnd approx: 2675.

Coal County: Magnolia's Hockett 1, ne se ne 10-2n-8e, abnd 7767.

Cotton County: E. P. Griffin's Russell 1, ne ne sw 16-2s-13w, abnd 1987.

Grant County: Sunray's Kent 1, ne ne ne 21-26n-8w, abnd 6471.

Okfuskee County: Donald T. Ingling et al's Simmer 1, sw nw nw 26-10n-8e, abnd 3625.

Pawnee County: Porter O&G Co.'s Taulman 1, nw ne ne 15-23n-4e, abnd 4192.

Payne County: Deep Rock Oil Corp.'s Manning 1, nw se nw 29-18n-6e, abnd 3892.

Pontotoc County: Car-Wooley's Stanfield 1, se nw nw 28-3n-4e, abnd 1236.

Pottawatomie County: Danciger O&R Co.'s Bowlan 1, se sw ne 34-10n-3e, abnd 5338.

Seminole County: Justrite Drlg. Co.'s Smith 1, nw ne nw 28-7n-6e, abnd 3422.

WEST CENTRAL TEXAS NEW PAY TEST

Coke County—Jameson Field: Sun's Fred Jameson 1, c ne nw H&TC 315, blk 1-A, elev 2065, Crinoidal 6136, Mississippi 6860, Ellenburger 7045, flow 248 bbls 47.2-gr, gor 1508/1, natural via ¼-in fr Crinoidal perf 6165-6345, comp 4-15-47 at pb td 6345, td 7130.

NORTH CENTRAL TEXAS WILDCATS

Haskell County: Doyle Pet. Corp.'s Montgomery 1, 467 snl 7250 wel James McGee sur, elev 1484, abnd 4-12-47 at 4259.

Shackelford County: S. B. Roberts-U. L. Miller's Davis 1, 1725 snl 1100 ewl T&NO Ry. 3, abnd 4-8-47 at 1645.

NORTH TEXAS WILDCATS

Archer County: Fain & McGaha's Parkey 1-A, 900 wel 330 nsl ATNCL sect 1, elev 1051, K-M-A lime 3970, abnd 4-10-47 at 4502.

Fain & McGaha's Parkey 2-A, 660 out sec ATNCL sect 1, abnd 4-12-47 at 1685.

Bridwell Oil Co.'s Campbell 1, 200 snl 1500 ewl sect 1379, TE&L Co. sur, abnd 4-8-47 at 1031.

Clay County: Fortex Oil Corp. et al's McCarty 1, 1400 snl 1155 ewl blk 46, Specht & McCutchin sur, abnd 4-10-47 at 1317.

Cooke County: Nutting et al's Purcell 1, 150 out nec J. T. Davidson sur, abnd 4-10-47 at 2058.

Lloyd Oil Co.-Starr Oil Co.'s Simpson 1, 330 out nec 80-ac lse, John Haggerty sur, elev 726, Ellenburger 4590, abnd 4-15-47 at 4693.

SOUTH CENTRAL TEXAS WILDCATS

Edwards County: Ray E. Pool's Joe Sid Peterson 1, 660 fr nw&swl sw½ n¼ sect 44, M&ERR sur, Ellenburger lime 4425, abnd 4-4-47 at 4851.

Travis County: Walker & Wagner's T. J. Ledel 1, 1000 fr n&wl T. McLane sur, Georgetown lime 1285, abnd 3-19-47 at 1286.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Duval County: Texon Royalty Co.'s Servando Benavides Heirs 2, 660 fr nwl 6450 fr swl 735-ac tr, on 1142.2-ac lse, El Mesquite Gr, blk 46, e of O'Hern fld, abnd 4-1-47 at 4507.

John F. Camp & Sons' J. F. Welder Heirs 2, 2310 fr nl 990 fr wl 420-ac lse, 4910 fr nl 6270 fr wl S. Alexander sur 102, abnd 4-8-47 at 2594.

Jim Wells County: DeLanger & Rowe's Sengelmann & Wolters 1, 330 ne of swl lots 12-13, T. Lang sbdn, Casa Blanca Gr, 710-ac lse, 1 mi ne Quinto Creek fld, abnd 4-8-47 at 5254.

Starr County: V. F. Neuhaus' P. Canales 1, 330 fr nwl 4250 fr swl tr 4, sh 2-B, 4250 fr swl 3400 fr nwl La Sacatosa Gr, abnd 4-8-47 at 1739.

Webb County: Hickok & Reynolds' Amado Perez et al 1, 330 fr n&el 215-ac lse, 330 fr el 1277 fr n, J. Poitevent sur 459, abnd 4-11-47 at 2631.

Zapata County: Herman Brown's Medario Pena 1, 467 fr nwl 1455½ fr nel 160-ac lse, out of 1133.75-ac tr, Porc 33, M. Trevino Gr, abnd 4-12-47 at 5088.

MIDDLE TEXAS COAST WILDCATS

DeWitt County: Atlantic's Walter Shaefer 1, 467 fr nw&swl 147.78-ac lse, Thos. H. Bell sur, abnd 4-10-47 at 8768.

Jackson County: Hinkle Drlg. Co.'s "L" Ranch 1, 682 fr nl 330 fr wl 187.5-ac Magnolia Farmout, D. A. Hoffman sur, abnd 4-15-47 at 6529.

Stewart Pet. Co. et al's R. E. Beamon 1, 330 fr nw&swl 80-ac lse, sw 80-ac of se¼ sect 5, C. W. Hahl's sbdn D. H. Burn Rch, J. J. Linn sur, abnd 4-6-47 at 5130.

Live Oak County: Heyser & Heard's A. B. Foster et al 1, 467 fr sely/nwl 467 fr nely/nel 729.58-ac tr, 3400 fr nwl 4950 fr swl Refugio CSL sur 8, abnd 4-5-47 at 4083.

UPPER TEXAS COAST WILDCATS

Chambers County: Fidelity O&Roy.-Magnolia's Hebert Tr. et al 2, 467 fr nl 50 fr wl John Donegan sur, sect 173, 1 mi se Seabreeze prod, 4734-ac lse, abnd 4-9-47 at 10,517.

Josey-Bruton's Julia H. Casey 1, 467 fr nl&sw at ra fr ely/l of 96.13-ac lse, S. Barrow sur, 1 mi s of e side of S. Cotton Lke prod, abnd 4-13-47 at 6908.

UTAH WILDCAT

Emery County: Mountain Fuel Supply's Unit 1, nw se sw 18-26s-7e, S. Last Chance, Chinle 1710, Moenkopi 1985, Coconino 3038, abnd 3500.

WYOMING OUTPOST

Albany County—Herrick Dome: Superior's Herrick 2, sw se sw 1-16n-76w, Sundance 2477, Casper 3625 (wtr), Fountain 3950, abnd 4-16-47 at 4209.

General American Buys

Alex Ryan, Longview independent operator, confirmed reports that his partner, B. Barnes, had sold the latter's half interest in ten East Texas field producers to General American Oil Company for $284,000. Ryan retains his half interest in the wells involved. Located in the Willoughby, Beane and Spear tracts and the I-GN right of way, in the Van Winkle and Caruthers Surveys, eight of the wells fall in the Kilgore townsite and two lie in the east-central part of the field.

Water-Flooding Asked

Shell Oil Company has asked permit of the Oklahoma Corporation Commission to water-flood leases in Sects. 31 and 32-24n-17e, Rogers County. Hearing has been set for May 13.

O. H. Beshell, district superintendent for Magnolia Pipe Line Company in the Illinois-Indiana area, has been transferred from Danville, Ind., to Midland, where he will serve as West Texas-New Mexico division superintendent. **F. G. White,** district superintendent in the north portion of West Texas, will retain this district and also have supervision of the company's gathering systems in New Mexico and Texas Panhandle, with headquarters at Brownfield, Texas. **V. L. Red** will continue as district superintendent in the south portion of West Texas, and extending east to Sweetwater.

»

A. E. (Al) Collins, manager of purchasing and stores, Los Angeles, on April 1 completed 35 years of service with Shell Oil Company. **S. F. Bowlby,** vice president, Los Angeles, celebrated the occasion by presenting Al with a service emblem pin with three diamonds.

»

Donald M. Taylor has joined the Tennesee Gas and Transmission Company's Engineering Department and will be stationed at the compressor plant at Natchitoches, La. Taylor, mechanical engineer, was formerly with the E. B. Badger Company of Boston in refinery construction work and is a veteran of 2½ years in the Navy. After his discharge and before going with Tennessee Gas, he was a partner in an engineering firm in Baton Rouge, Louisiana.

»

Frank E. Smith of London, England, well-known physicist and world expert on electrical standards, has been appointed director of research for Anglo-Iranian Oil Company.

»

Vice Admiral Harold Brown, engineer in-chief of the British fleet, and controller general of munitions production during the war, has been named chairman of the British fuel research board.

»

Lieut. Gen. W. G. Lindsell, recently retired from the British army after 42 years' service, has been named to the board of directors of the Manchester, England, Oil Refinery.

»

Gorges F. Cance has arrived in New York from Paris to assume his duties as technical assistant to the New York manager of Societe Nationale de Material pour la Recherche et l'Exploitation du Petrole (SN MAREP), the purchasing commission for the French government petroleum interests. He will replace **Roger Buttin,** who is to start soon on an extended trip through the oil areas of Texas and California before returning to France.

»

Dr. George S. Hume has been promoted to chief of the bureau of geology and topography, Mines and Geology Branch, Canadian Department of Mines and Resources, succeeding **F. C. C. Lynch,** retired. Dr. Hume is well known to the Canadian and U. S. oil industry, through his work on oil geology of the Western Canadian Plains while on the staff of the Canadian Geological Survey, 1921-41, and as advisor to the Canadian Oil Controller in 1941-45.

P. E. Fitzgerald of Dowell Incorporated has left for Caracas, Venezuela, in connection with work for United Oilwell Service, S. A., of which he is a director. Later he will visit United's field camp and offices at San Joaquin in eastern Venezuela. Accompanying him is **Ralph Smith,** Gulf Coast district engineer for Dowell.

»

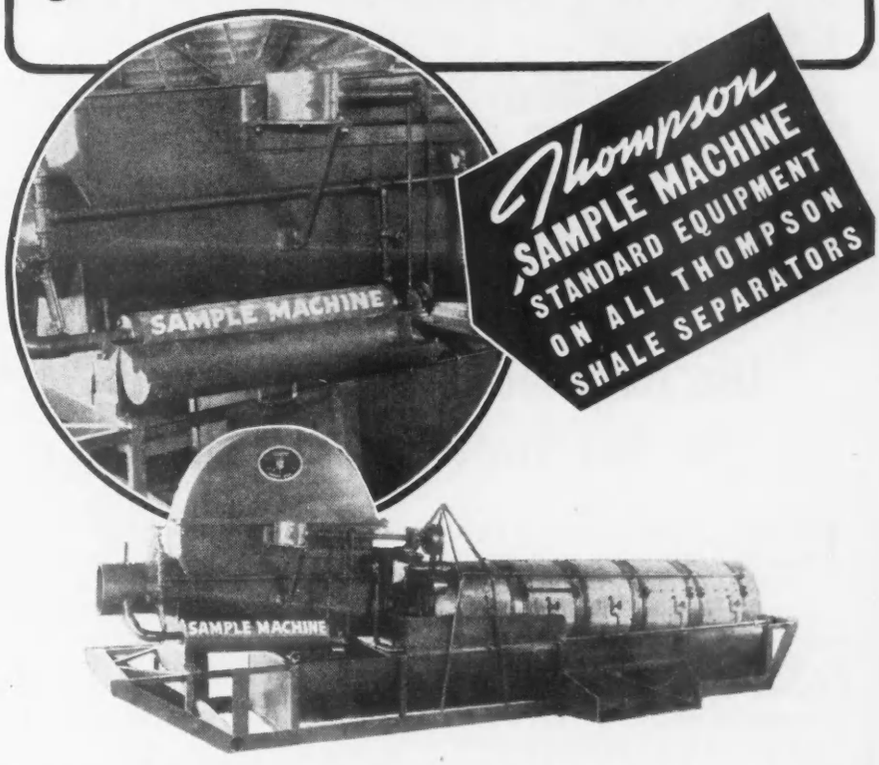
Henderson Supplee, Jr., president of Supplee-Wills-Jones Milk Company, has resigned to become a vice president of The Atlantic Refining Company.

G. T. Roberts, senior exploitation engineer in Shell Oil Company's Tulsa office, has been transferred to Houston. **J. B. Jones,** chief clerk in the Jackson, Miss., office, has been transferred to Houston. **Frank Perkins, Jr.,** junior exploitation engineer at Black Bayou, La., has been moved to Houma, La. **M. L. Clayton,** Houma, La., has been promoted to senior drilling foreman.

»

Ernest Cockrell, Houston oil man, has been elected president of the Houston Club.

The Easiest . . . Quickest . . . and most Economical Way to get DEPENDABLE SAMPLES



In addition to doing a thorough job of reconditioning drilling mud, the Thompson Shale Separator provides geologists with accurate foot by foot samples of cuttings and mud. By pushing a lever, part of the flow of mud is diverted into the Sample Machine. Here the mud is separated into . . . shale and abrasives . . . drilling mud . . . and deposited into two, easily accessible, catch basins. Many operators claim this alone is worth the entire cost of the Thompson Separator. Look for the Sample Machine on the Thompson Separator . . . it's the field-tested method of obtaining dependable samples.

THOMPSON TOOL CO. Iowa Park, Texas

KEEPS DRILLING MUD *CLEAN* — PROVIDES *TRUE SAMPLES* OF CUTTINGS

Robert T. Sheen was named president of the Milton Roy Company, succeeding the late **Milton Roy Sheen. John W. Walker** was chosen vice president and general manager; **E. Elizabeth Sheen**, secretary; and **John J. Smith**, treasurer.

»

Garth L. Young, formerly chief engineer for Signal Oil and Gas Company, has been elected vice president. Young, who for some time has been a vice president and director of Signal Oil Company, the company's marketing subsidiary, now serves as vice president and director of the parent company as well.

W. M. (Mel) Stirtz, district geologist for Kerr-McGee Oil Industries, Inc., in the North Louisiana-Arkansas district for the past 2½ years, has resigned to accept a position in the geological department with British American Oil Producing Company in the Tulsa office. Succeeding Stirtz is **Ben Curtis**, who has been affiliated with the Kerr-McGee office in Shreveport for the past year.

»

Lester Patrick of Houston and **Franklin E. Davis** of Taft, Texas, have organized the Lester Drilling Company, Inc., with capital stock of $15,000.

Use corrosion-resistant TRANSITE for Salt Water Disposal Lines

IS costly replacement of pipe due to corrosion a problem in *your* salt water disposal lines?

It need not be! Producers in many fields have found in Transite a pipe that gives years of dependable service . . . eliminates costly pipe replacements. They know that because it is made of asbestos and cement, Transite is remarkably resistant to the corrosive action of salt water in the inside, corrosive soil on the outside.

Transite has other advantages, too. Light in weight it is easy to handle . . . most sizes can be unloaded and lowered into the trench without mechanical handling equipment. And Transite's factory-made Simplex Couplings speed assembly . . . provide tight yet flexible joints that permit laying the pipe around curves without special fittings.

Use Transite Pipe to save on installation . . . curb corrosion . . . reduce maintenance in your salt water disposal lines. Write Johns-Manville, Box 290, New York 16, N. Y.

JM PRODUCTS

Johns-Manville
TRANSITE PRESSURE PIPE

Deaths

W. C. Trout, president of Lufkin Foundry & Machine Company, died at Dallas April 24. He was born in Canada and became connected with the Lufkin Company in 1905, developing a complete line of sawmill machinery before the company entered the oil industry in 1920. A well-known engineer and inventor, he was an officer and director of several other enterprises. He was a member of The American Petroleum Institute, the American Society of Engineers and various commercial and civic organizations.

W. C. Trout

»

George D. Yetter, 61, veteran Tulsa oil man and accountant, died April 16. Formerly associated with several oil firms in Tulsa and in Pennsylvania, Yetter was employed by British American Oil Company at the time of his death.

»

William L. Gupton, Sr., 53, head of the right-of-way department in the Fort Worth division of Sinclair Refining Company, pipe line department, and an employee since 1919, died April 21 of a heart attack at his Fort Worth residence.

»

Milton Roy Sheen, 63, president and co-founder of the Milton Roy Company, pump manufacturer, died April 3 at Glenside, Penn. Sheen designed the chemical pumps made by his firm and also was known widely as an inventor. In 1919 the Franklin Institute awarded him the Edward Longstreth Medal for meritorious work in science and invention.

»

Sir William Brown, K.C.B., secretary to the British Ministry of Fuel and Power in 1942-43, died recently in London. In 1944 he acted as chief technical adviser to the British delegation which negotiated the Anglo-American Oil Agreement.

»

E. B. (Ed) Wood, 46, sales engineer with Wyatt Metal and Boiler Works, Houston, died April 18. He had been with Wyatt for approximately 12 years and prior to that time was in South America with Parkersburg Rig & Reel Company. A member of the Houston Nomads Club, Wood was born in Fort Worth, attended college in Canada, and served in the Canadian Air Force as an aviator in World War I.

»

D. F. Dickey, 77, Tulsa, retired Texas Company employe, died in Tulsa April 20. He was a native of Illinois. A resident of Oklahoma since before statehood, Dickey joined The Texas Company in 1918.

Vice Presidents and Director Named by Raybestos-Manhattan

Two vice presidents and a director were added at the annual stockholders' and directors' meetings of Raybestos-Manhattan, Inc., in New York City.

John H. Matthews, assistant general manager of the Manhattan Division, was named vice president in charge of the Manhattan Rubber Division, Passaic, N. J.; O. H. Cilley, assistant general manager of the United States Asbestos Division, Manheim, Penn., was made a vice president; and A. F. Heinsohn, general manager of General Asbestos and Rubber Division, North Charleston, S. C., was placed on the board of directors.

Drilling Specialties Firm Formed By Phillips Petroleum Company

Drilling Specialties Company, Bartlesville, Okla., has been organized by Phillips Petroleum Company to handle sales, licensing and service of Driscose, a new drilling and additive.

Directors of the new firm are as follows: S. S. Learned, H. H. Kaveler and George R. Benz. Officers are George R. Benz, president; C. C. Crawford, vice president; J. R. Pettigrove, vice president; B. F. Stradley, secretary-treasurer; P. J. Parker, assistant secretary-treasurer; T. V. Stevens, assistant treasurer; and R. E. Arnold, assistant secretary.

The company also plans to introduce other products, equipment and services to promote economical well drilling.

Allan J. Edwards, Inc., Formed As Successor to Hampton Company

Allan J. (Scotty) Edwards, co-partner in the firm of M. F. Hampton & Company, dealers in pipe line and oil field equipment and supplies, has purchased the partnership to create Allan J. Edwards, Inc.

The new corporation will continue to handle the same line of pipe line and oil field equipment and supplies as formerly, retaining the same offices in the McBirney Building in Tulsa.

Edwards has been actively engaged in the oil field supply business for 25 years. For 20 years he was associated with Black, Sivalls & Bryson, a major portion of the time as general sales manager.

Store Managers at Texas Points Named by Continental Supply Firm

The Continental Supply Company has announced the appointment of F. S. Vernon as store manager at Carthage, Texas, succeeding F. N. Metcalf, who has been made foreign representative. Vernon formerly was a field salesman at Shreveport.

James E. Keffer, formerly floorman at McCamey, Texas, has been named store manager at that point. He succeeds R. K. Thompson, resigned.

Lone Star Cement Firm to Enlarge Facilities at New Orleans Plant

To meet the demand for cement, the Lone Star Cement Corporation will increase the production capacity of its New Orleans plant. The additional facilities will consist of a 385-foot kiln, with a capacity of 2000 barrels a day, together with the installation of a large combination mill for raw grinding and a new finish grinding unit, to bring the total capacity of the plant up to 6000 barrels daily.

This program involves an expenditure in excess of $1 million and contracts are being placed for the delivery and installation of the necessary equipment. Work will be pushed with the utmost speed.

Jones & Laughlin Supply Opens Store at Pauls Valley, Okla.

Jones & Laughlin Supply Company has opened a store at Pauls Valley, Okla. William D. Breedlove, formerly with the company at Seminole, Okla., will manage the store and will operate it as part of the central and southern Oklahoma District, under L. R. Roberts, district manager of Wewoka, Okla.

R. A. Weber has been made field salesman in the Hutchinson, Kansas, area.

HERE'S WHERE TROUBLES STOP
JP RODS
AND
LINERS
Insurance against costly work stoppages . . . that's what JP rods and liners give you because they're machined to fit and are so tough. Service in the field from here to Okotak, from here to Caracus, from here to the South Seas bears out this statement.
PRECISION MACHINED & HARDENED HARD
JP Piston Rods are made from the finest material available (tensile strength of over 120,000 pounds per square inch)—JP Liners are made from high grade steel forgings. By a special process, each rod and liner is hardened and individually inspected to pass 600 (or better) Brinell test.
Made to A.P.I. standards, JP Rods and Liners are available in all stock sizes (and special sizes) to fit any slush pump. Start NOW using JP (abrasion resisting) Rods and Liners.
JP
CALL—WRITE—WIRE—CABLE
for information on sizes and prices . . . Ask for our New Catalog . . . give us your specifications.
J P Machine & Tool Company
1534 S. E. 29
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Tel. 3-8700
Oklahoma City

Stewart & Stevenson Headquarters Completed

The postwar expansion and reorganization program of Stewart & Stevenson Services was climaxed by the completion of new general offices, larger parts and servicing department, remanufacturing plant and show rooms for General Motors diesel engines, electrical switch gear, and Continental Red Seal Engines at 4516 Harrisburg Blvd., Houston. The new facilities also include sales conference rooms and a larger, modern engineering department. The new buildings cover more than a square block. Within the past 12 months the company has expanded by opening branch offices in Dallas, McAllen, Corpus Christi and Wichita Falls, with complete facilities for sales service and installation of G.M. diesel power equipment.

Branch Management Appointments Made by International Harvester

International Harvester Company has announced the following changes in branch management:

W. E. Callahan, formerly retail manager at Chicago's north side branch, has been appointed assistant branch manager at Chicago. L. A. Weinmann will also continue as assistant manager.

A. L. Metz, formerly credit and collection manager at Fort Wayne, Ind., has been appointed assistant branch manager at Kankakee, Ill.

D. H. Gummerson, formerly assistant manager at Albany motor truck branch, and V. I. Pearson, formerly retail manager at Baltimore, have been appointed assistant managers at Boston motor truck branch.

Ray Cross, formerly retail manager at Providence, R. I., has been appointed assistant manager at the Albany truck branch.

Two Important Branch Posts Are Filled by Mack-International

Appointment of managers for two of the most important of Mack-International Motor Truck Corporation's 67 direct factory branches has been announced by A. C. Fetzer, vice president.

John A. Sloan, formerly district manager at Des Moines, Iowa, will serve in the same capacity at Mack's Chicago branch.

A. L. Monck, formerly of Mack's St. Louis branch, has been named district manager in charge of the company's Des Moines branch.

Three District Managers Named By Air Reduction Sales Company

Three district managers have been named by Air Reduction Sales Company.

L. A. Hamilton, formerly assistant manager in Seattle, has been named manager of that district, which embraces most of Washington, the northern part of Idaho and Montana.

Emmett W. MacCorkle, Jr., has been named district manager at Portland, which encompasses Oregon, the southern half of Idaho and part of Washington.

Herman Van Fleet, Jr., has been named manager of the New England district, which takes in Maine, Vermont, New Hampshire, Massachusetts, Rhode Island and the eastern third of Connecticut.

Bethlehem Appointments Made

H. B. Gilmore, field representative in the Artesia, N. M., area, was appointed store manager and field representative at the Artesia store of Bethlehem Supply Company, succeeding F. E. Smith.

W. B. House, company field representative at Houston, has been transferred to Eunice, La., as field representative for that area.

Distributor Named

Transamerican Factors Ltd., Los Angeles, has been appointed West Coast distributor for rock bits manufactured by Engineering Laboratories, Inc., with plants in Texas and Oklahoma. Complete engineering services will be furnished.

To Move Offices

The Northwest Engineering Company, builders of shovels, cranes, draglines and pullshovels, will move its executive and sales offices May 1 to new and larger quarters in the Field Building at 135 South La Salle Street, Chicago 3.

Eagle-Picher Board Named

Stockholders of The Eagle-Picher Company have elected the following board of directors: Joseph Hummel, Jr., Joel M. Bowlby, Arthur E. Bendelari, Vincent H. Beckman, Carl F. Hertenstein, Robert E. Mullane, John J. Rowe, Carl A. Geist, Miles M. Zoller, T. Spencer Shore and Elmer Isern.

All officers of the company were reelected. They are Joel M. Bowlby, president; Carl A. Geist, vice president, secretary-treasurer; and William R. Dice, vice president and comptroller.

AIN'T SPRING GRAND-PETE?!
SURENUFF — AND THOSE FRICTION SPRINGS ON THE LANE-WELLS PACKER ARE AS STURDY AND AS WELL PUT TOGETHER AS YONDER YEARLING!!
LANE-WELLS
LANE WELLS COMPANY

SQUEAKS from the BULL WHEEL

Hints for Householders

Newest wrinkle in chain letters is the Harem Letter. First, you write a letter to five of your married friends, explaining the idea. Then you bundle up your wife and send her to the friend whose name heads the list. When your name works to the top of the list you will receive 17,481 women—for keeps!

But beware! Do not break this chain. One man did—and got his own wife back!

Short Story

An aviator flying a two-motored plane in a fog had the following conversation with a nearby flying field:

"This is C-104 calling the tower.'

"Tower to C-104. Go ahead."

"C-104 to Tower: I am nearly out of gas. What shall I do?"

"Tower to C-104: Circle field for five minutes and call back."

At the end of five minutes the pilot called the tower again.

"C-104 to tower: My left motor is out. What shall I do?"

"Tower to C-104: Circle field for five minutes and call back."

At the end of five minutes the pilot called again.

"C-104 to tower: My right motor is out, my left motor is out and I'm out of gas. What do I do?"

"Tower to C-104: Repeat after me—'Our Father Which Art in Heaven'—".

Passing the Plague

"Doctor, my son has cholera, and worst of it is, he admits he caught it from kissing the maid."

"Well, well. Young people do thoughtless things, don't they?"

"Yeah, but Doctor, I've been kissing the maid myself."

"Too bad."

"And what's more, I've been kissing my wife."

"What! Oh, my gosh! Now we'll all have it."

Something In Common

A worried husband took his wife to a psychiatrist.

"Doctor, there's not a thing in the world wrong with me. He brought me here just because I like pancakes."

"Nothing wrong with that. I happen to be very fond of pancakes myself."

"Oh, Doctor! You are? You must come out to see me some time. I have trunks full of them."

Against His Principles

A certain gambler crouched on the pier, made a running start and jumped into the Gulf. A friend who knew the fellow couldn't swim, leaped in and hauled him out, half drowned.

"What's the idea of trying to commit suicide?"

"I wasn't trying to commit suicide!" was the peevish reply. "A guy up the street bet me I couldn't jump across the Gulf."

"Then you're crazy. Don't you know you can't jump across the Gulf?"

"Certainly. But he offered me 10,000 to 1. At those odds, I could't afford to turn the bet down."

Service

Arriving at a party on a hot afternoon, he called for something tall, cool and with lots of gin in it.

Just then his host walked up. "May I present my wife!"

Life Is Like This

A contractor went out to inspect one of his postwar housing projects. Walking up to a house in which a carpenter was working inside, he whispered: "Can you hear me through this wall?"

"Sure."

"Can you see me?"

"Not very well."

"That," said the contractor, "is what I call a good wall."

This Curious World

An old flame is what a girl uses to burn up her new boy friend.

A conversation between women always concerns who, why, how, when, and wear.

Does he love her? Why, he worships the ground her father struck oil on.

The modern girl is one who, upon seeing a wolf at the door, is reminded that she needs a new fur coat.

She's jealous of her husband's stenographer because she used to be his stenographer.

All work and no play makes jack.

OWEN

Type "A" Work Benches

Finest in the Field!

Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.

They're the finest in the field for saving tools and providing a safe, convenient working space. Put one on each rig you operate . . . they'll "dress up" its efficiency and appearance.

SOLD THROUGH ALL SUPPLY STORES

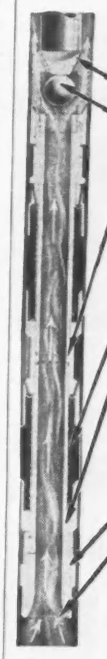
OWEN TOOL COMPANY

ROUTE 9 BOX 800-B V-2-4341 HOUSTON, TEXAS

"Best Bet Yet"

DEEP WELL SWABS

Field production men set the specifications for this new Swab. It does the job they asked for. Large fluid clearances for quick, free dropping. Pulls light or heavy loads from great depths. No fluid loss, complete load each trip. Sensitive rubbers automatically adjust to right wall pressure for weight of load. Rubbers firmly supported yet easily preset to irregular tubing I.D.'s and to compensate for wear. Simple design. Easy to operate on rig floor. Standard cage, ball and seat, replaceable anywhere. Quickly tandemed. Actually cuts swabbing costs and time.



- Large fluid passage.
- Standard reversible ball and seat.
- Rubber quickly changed on job.
- Break here to install rubber.
- Rubber easily adjusted—0.42" under tubing I. D.
- To expand rubber make up on cup.
- Two reinforced PBX Special Rubbers used.
- API threads. Lead compounded for easy break.
- Alloy steel throughout. Heat treated to maximum tensile strength. Rust proofed per Navy specifications.
- Break here to tandem swab.
- Large internal area, streamlined, reduces tendency to blow out of hole.

Write for Catalog No. 340

Specify

PATTERSON-BALLAGH

A DIVISION OF BYRON JACKSON CO.

"Best Bet Yet"

DEEP WELL SWABS

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6247 Navigation Boulevard, Houston 11
808 Graybar Building, New York 17
931 Russ Bldg., San Francisco 4

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The OIL WEEKLY

ENGINEERING NEWS STATISTICS

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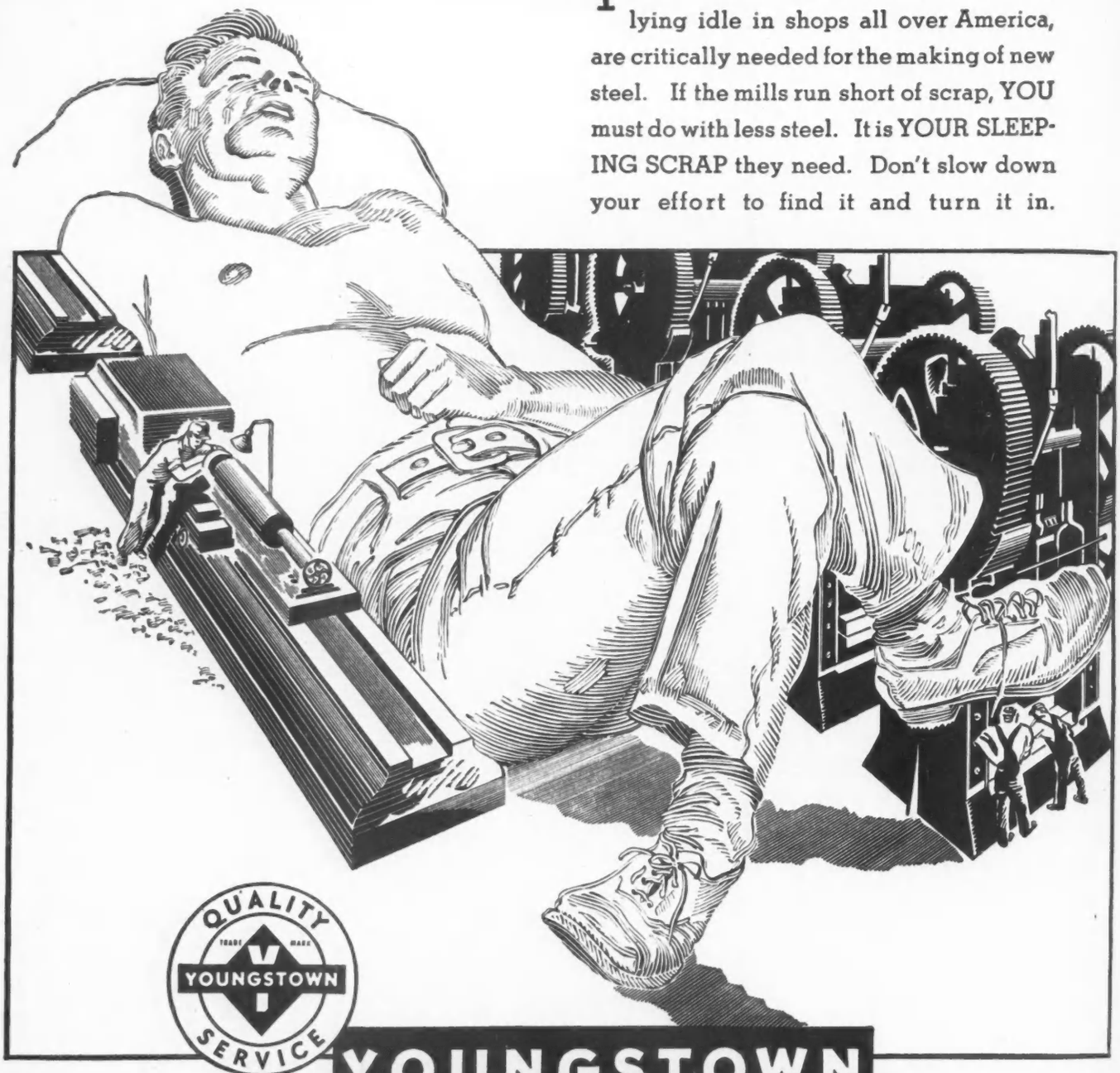

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THE CHANGING Panorama

Secondary Recovery Program of Compact

INDICATIONS are that much of the energy of the Interstate Oil Compact Commission in the future will be devoted to development of new methods of secondary recovery and dissemination of such information.

At the Birmingham meeting the Stripper Well Committee, the Engineering Committee and the Research and Coordinating Committee all discussed the problem and the research group proposed that fields be studied from their inception "so that the most efficient means of production can be determined and so-called secondary recovery programs begun long before the field reaches the stripper stage."

Success has been had through water injection in the East Texas field and the Midway, Arkansas, field and gas injection and cycling operations have served to maintain pressures through a long producing life. Concensus at Birmingham was that this method of operation was far more efficient and more likely to insure materially higher ultimate recoveries.

Generally, the compact committees will seek to sustain stripper wells as long as possible as producers, this, the Birmingham view seemed to be, without resorting to governmental subsidy. Thorough investigation will be made of the most skilled operations in the industry and these reports will be passed on to operators whose holdings do not justify a large engineering staff. The compact would employ an engineer of established reputation, he would be given a small staff which would be primarily engaged in the coordination and dissemination of information supplied through engineering staffs of various state regulatory bodies. Details of this program likely will be presented at the summer meeting of the compact.

Another act by the compact dealing with the important matter of secondary recovery took the form of a resolution recommending that each state make a survey of its stripper fields to determine the amount of oil that might be recovered by secondary recovery methods.

* * *

The National Petroleum Council has been cautious in forming its policy and in the future it may have the opportunity to be a bulwark of free enterprise in the oil industry.

W. C. WHALEY, President,
California Oil Producers Agency.

Texas Would Say Farewell to Flares

STEPS taken by Texas operators to remedy waste of gas from oil wells are detailed in a recent report made by Jack K. Baumel, chief engineer of the Texas Railroad Commission.

Since the first hearing held by the commission in 1946 on wastage of casinghead gas, 19 plants have been completed; nine are under construction and will be completed before next January and 39 plants are in the planning stage and probably will be constructed before 1949. Completion of these plants should eliminate the waste of 760 million cubic feet casinghead gas daily that is now being flared. Of this amount it is estimated that 452 million cubic feet will be used in transmission lines, leaving 308 million cubic feet available for daily injection into oil reservoirs for pressure maintenance. The 19 plants completed have stopped 177.3 million cubic feet daily that was being flared.

Gas conservation strides in Texas are further shown by daily average figures below (*gas in thousands of cubic feet*, oil in barrels):

	1939	1946
Oil production	1,305,617	2,070,959
Casinghead gas production	1,730,000	2,744,000
Casinghead gas utilized	768,000	1,555,000
Percentage such gas utilized	44.4%	56.7%
Percentage such gas flared	55.6%	43.3%

Since 1939, Baumel reported, 36 gasoline and repressuring plants have been completed and these plants processed during February, 1947, an average of 374,000 Mcf daily; of this amount, 47,800 Mcf was flared at the plant and 326,200 Mcf was utilized for legal purposes such as light and fuel and repressuring.

The part one company—Humble Oil & Refining Company—has had in eliminating these gas flares is told by two reservoir engineers in the current issue of *The Humble Way*.

"The first of the two principal methods of reducing the amount of flared casinghead gas is to use those well completion and operating practices which will minimize the amount of gas produced with each barrel of oil," the article states. "This is so closely tied in with efficient production of oil that Humble has used every known means to apply this principle. Its success is shown by the fact that less than 5 percent of Humble production is being taken from wells with gas-oil ratios higher than the field penalty ratio set by the state regulatory body.

"As a result of a survey of all its flared casinghead gas made soon after the war was over, the company has embarked on a far-reaching gas conservation program. The survey showed that Humble was producing approximately 408 million cubic feet of casinghead gas with 210 million cubic feet, or 52 percent, being flared. The 198 million cubic feet utilized reflected results of the prewar program.

"A current summary shows that since the war a definite program has been implemented for complete utilization of gas from 22 fields (nearly all facilities now complete or under construction) which were venting 110 million cubic feet per day."

So real progress is being made toward eliminating gas flares which have so long lighted Texas plains and disturbed conservation-minded citizens of the state.

MONTHLY INTERNATIONAL FEATURE ISSUE

The OIL WEEKLY

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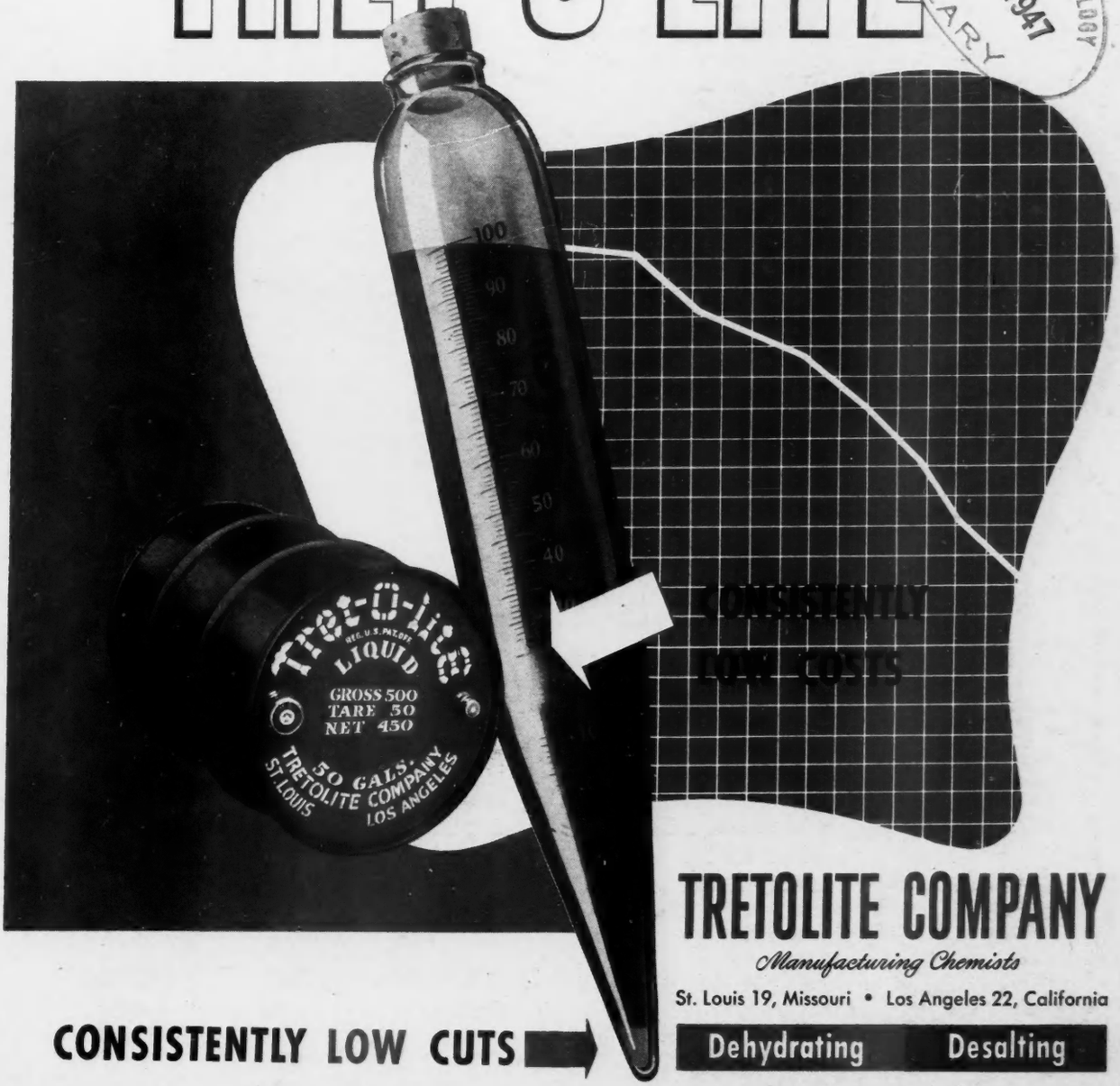

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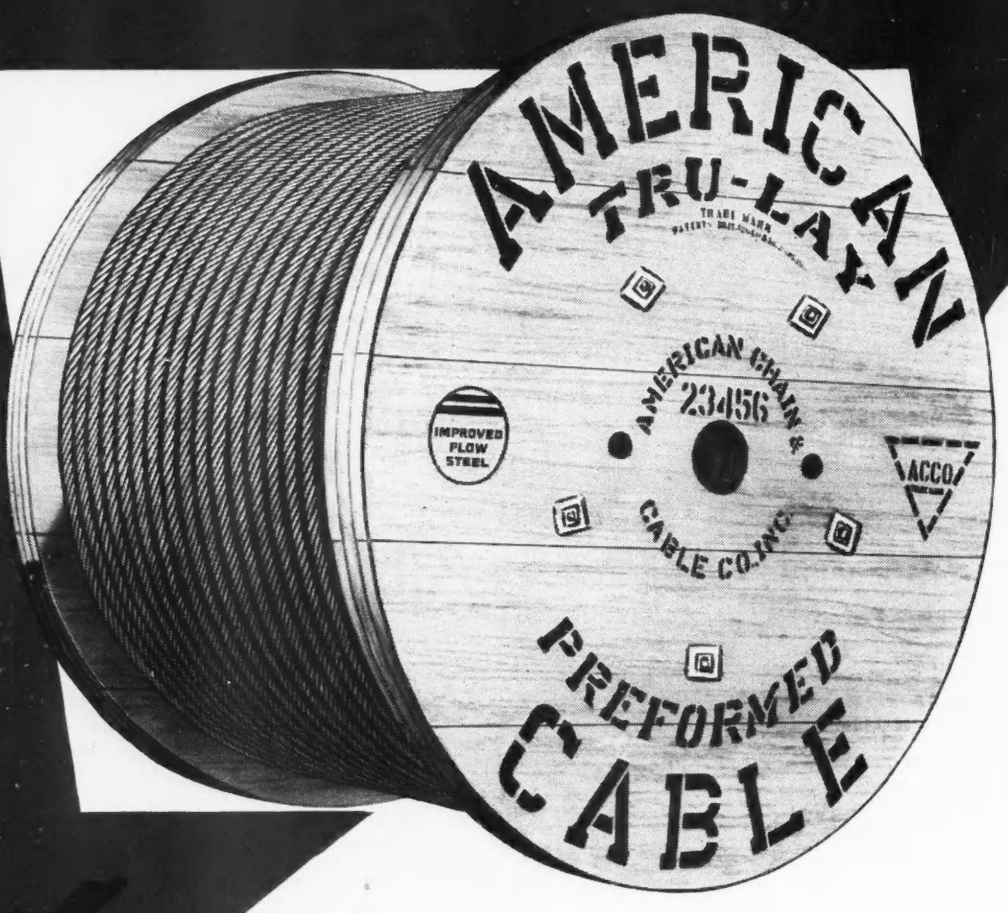

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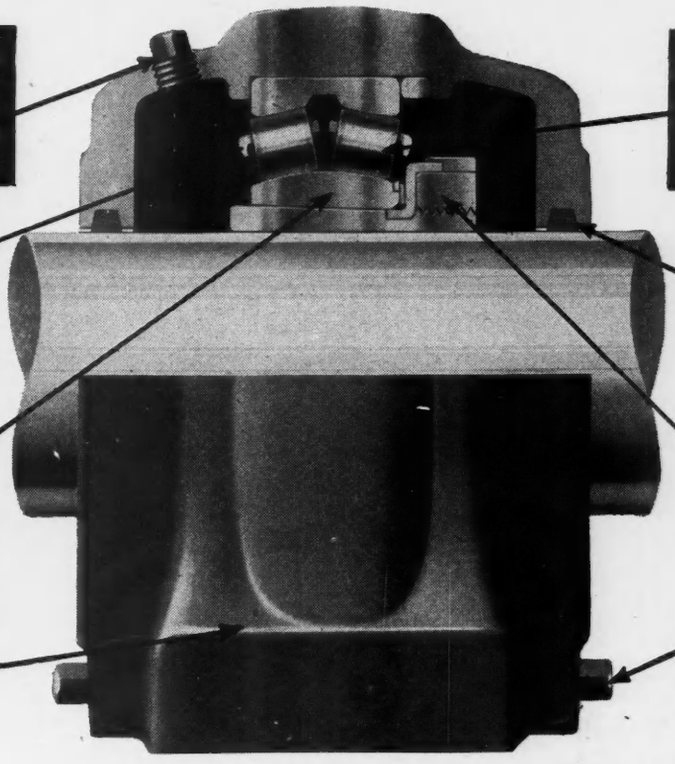

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Adapter type provides tapered sleeve to support inner race on shaft, giving secure mounting on commercial cold finished shafting. On precision turned or ground shafting the inner ring is press fitted directly on shaft for greatest accuracy of operation.

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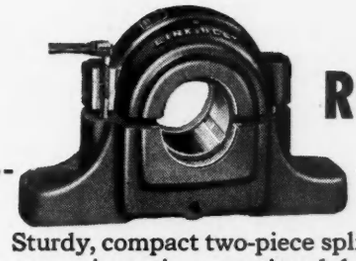

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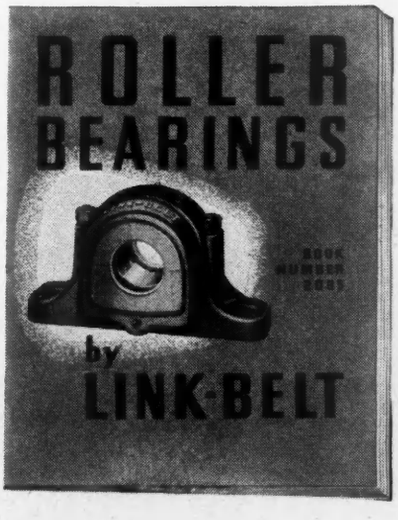

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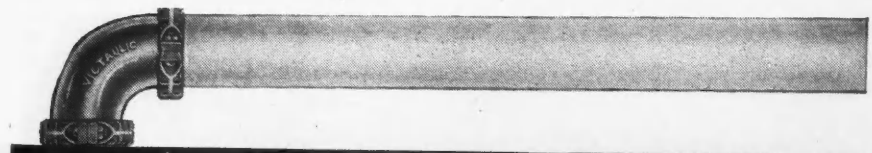

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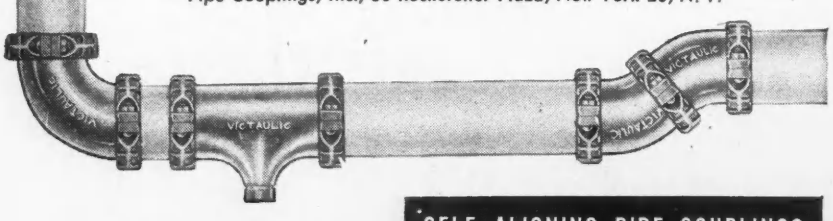

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Looking Ahead

WITH THE EDITOR

EVER-DEEPENING penetration of the drill in search for new horizons and possibility of production in known strata as they dip deeper below the surface imposes a load on drilling equipment which can be met only in part by redesign to use alloys which, though expensive, offer the easiest method for stepping up the load-bearing qualities of the equipment.

Engineers generally are concerned especially with the yield point in tubing strings, and in the wire rope which must serve not only for hoisting the heaviest drill string, but which must also be able to suspend the weight of the long strings of casing. Present record depths all but wipe out the factors of safety designed into casing and wire rope, reducing the former generous margins to near unity, and placing the loading so close to the yield point that, were it not for mitigating conditions down the hole, such as buoyancy of mud, the equipment would have failed in tension.

The manufacturers of deep well drilling equipment are alert to the demands which soon will be made on their heaviest rigs, and are devoting vast sums to research which will enable them to come up with solutions which will meet the driller's needs, and which will not require a redesign of the entire rig from the foundation up.

Surveying the future of casing and wire rope, as being the two factors most likely to hamper deepest drilling, H. M. Cooley, a metallurgical engineer for Bethlehem Steel Company, forecasts possible trends in design and size of equipment which will be used, basing his predictions regarding wire rope on the performance of lines surpassing by a wide margin the diameter generally regarded as maximum for drilling service. The article "Casing and Wire Rope," is scheduled for publication in the next number of THE OIL WEEKLY.

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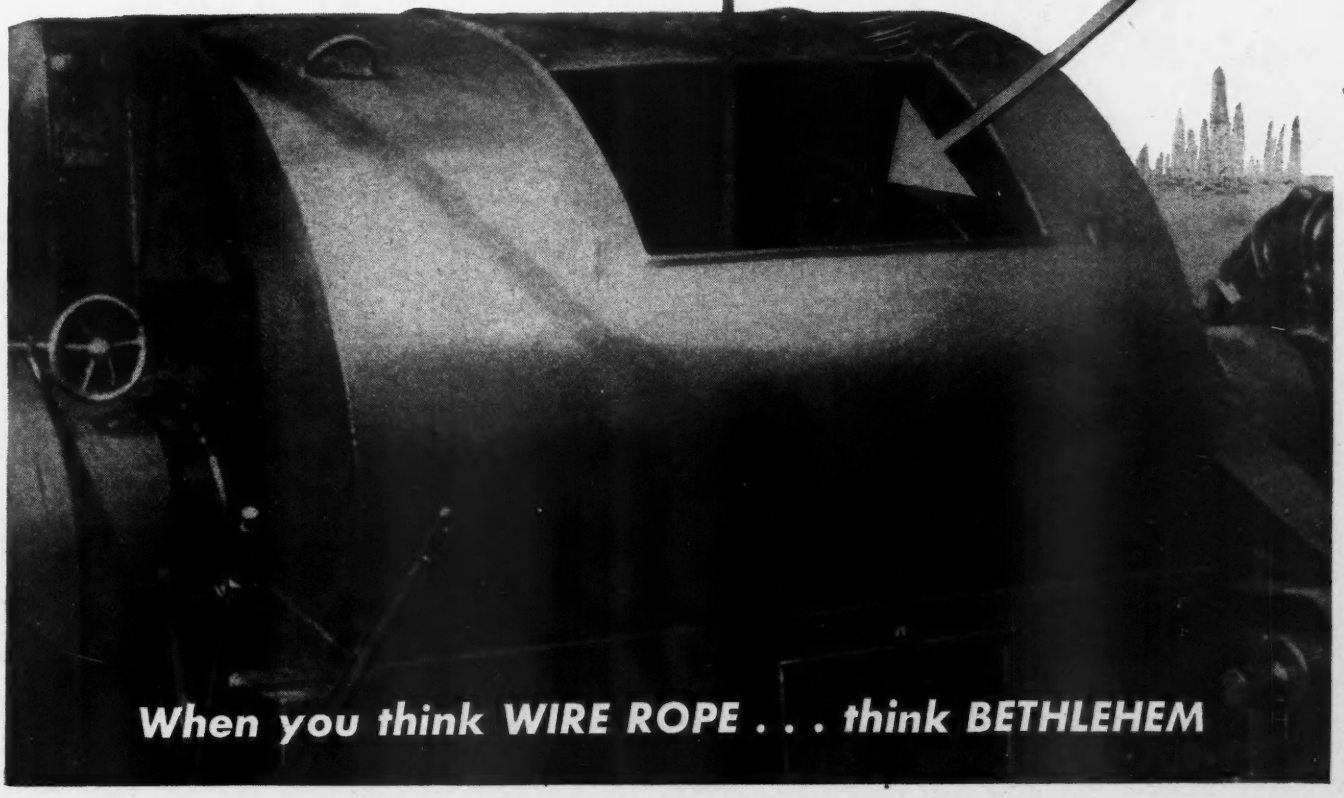

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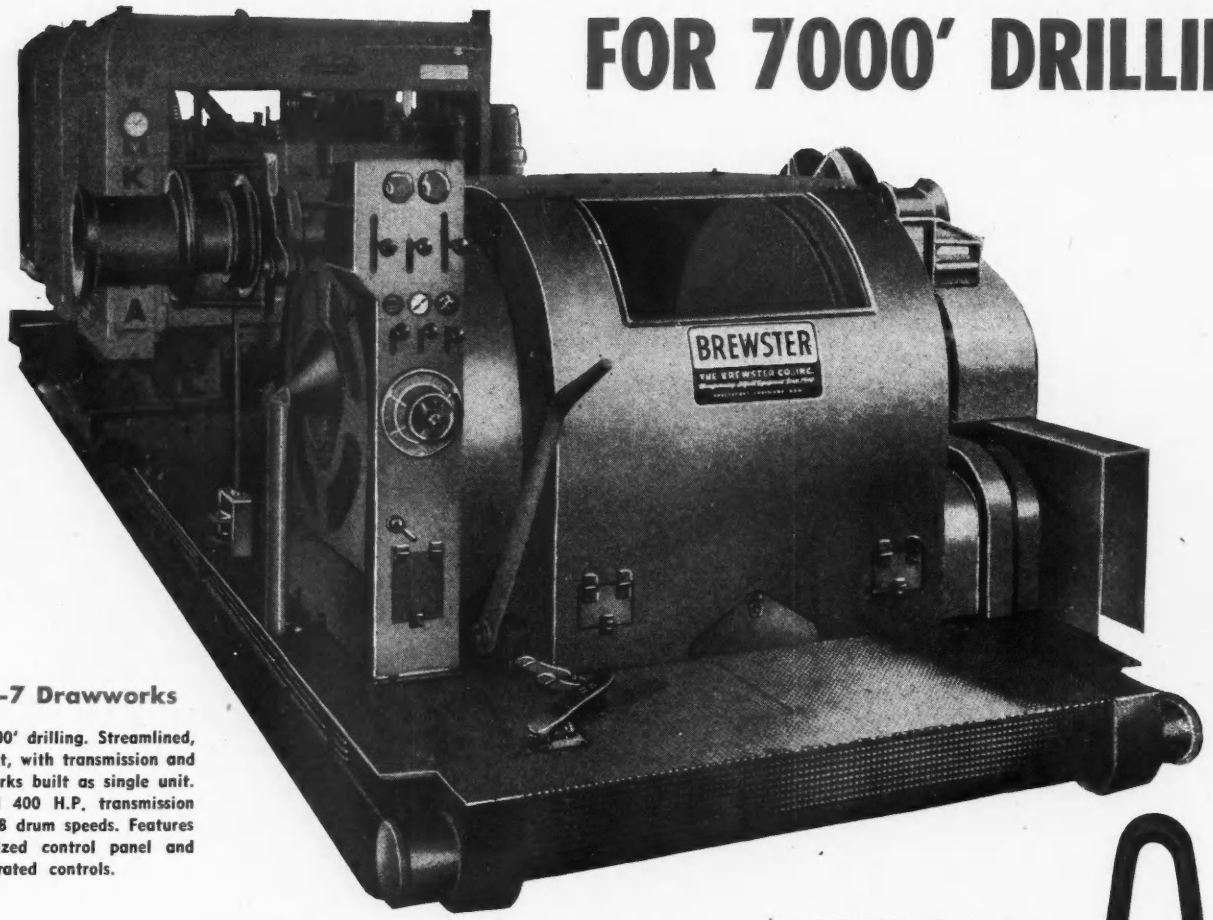

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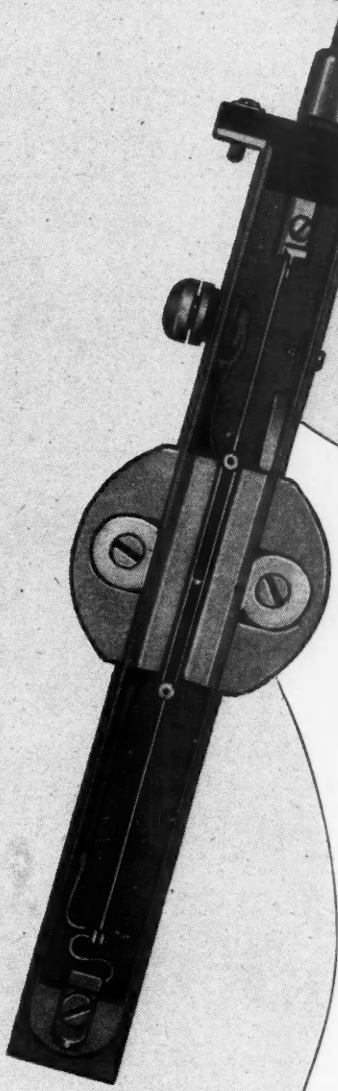

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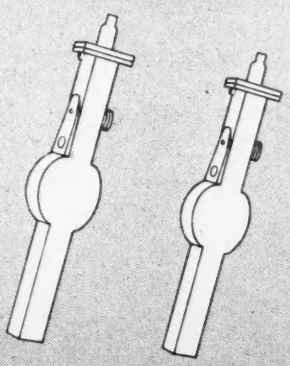

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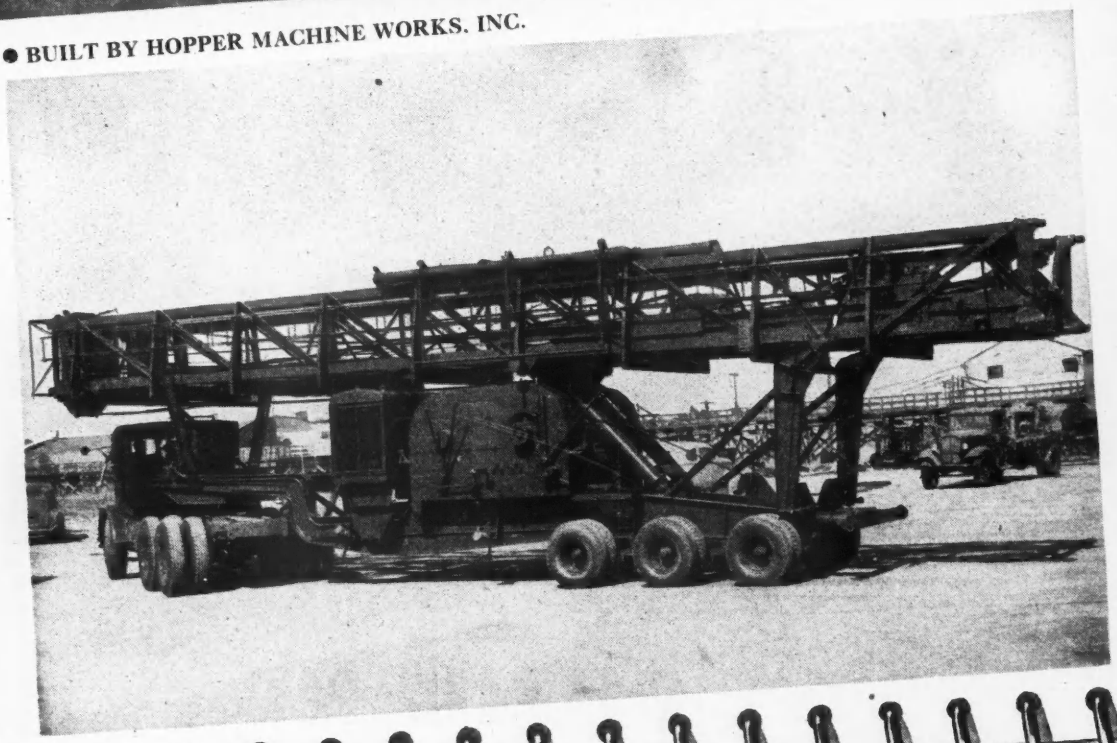

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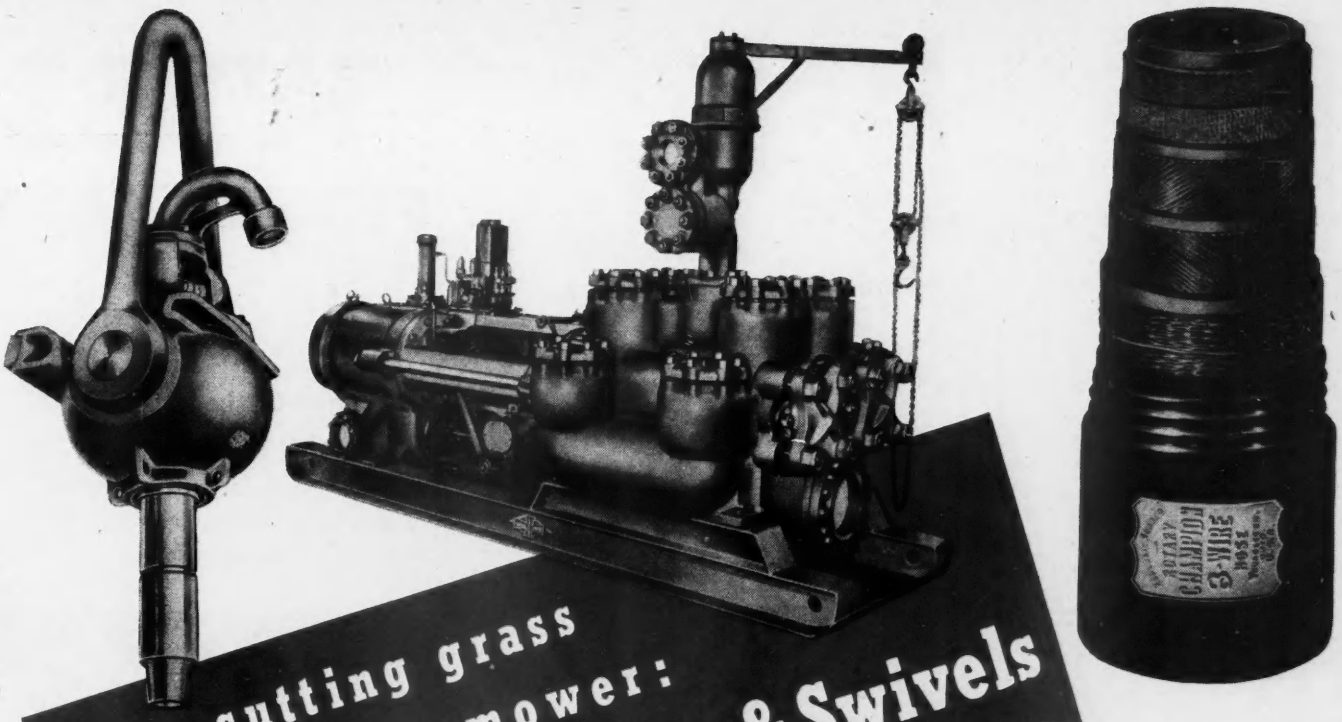


Like cutting grass with a power mower: WHELAND Pumps & Swivels Champion Hose by REPUBLIC

No pump and swivel as good as those made by Wheland should be coupled up with hose less dependable than Republic Champion Reprene. And . . . vice versa! They make tough drilling a pleasure!

This equipment is good for the pocketbook, swell for the crew. Wheland makes pumps, swivels and rotaries for drilling under any conditions. Republic makes hose to match. Your near-by Jones & Laughlin Supply store gets a real kick out of inquiries about this Wheland-Republic combination. And there have been some recent developments. Ask about them.

Jones & Laughlin Supply Company General Export Office: 230 Park Ave., New York 17, N. Y., U. S. A.

Lucey and Wheland Export: Lucey Export Corporation, 233 Broadway, New York 7, N. Y., U. S. A. Broad Street House, E. C. 2, London, England.

JONES & LAUGHLIN SUPPLY COMPANY

Subsidiary of Jones & Laughlin Steel Corporation

J&L STEEL

TULSA, OKLAHOMA

National WELL SERVES ALL

National Casing Head Type KHL-1

A simple unit designed to seal off a single string of casing in wells of medium depths and pressures.

National (Adjustable) Micro-Chokes

Type "D" Micro-chokes are of a thoroughly modern design and are used principally on high pressure wells.

National Type "A" Casing Support

Provides an economical means for supporting medium length casing string where no pressures are to be packed off outside the suspended casing.

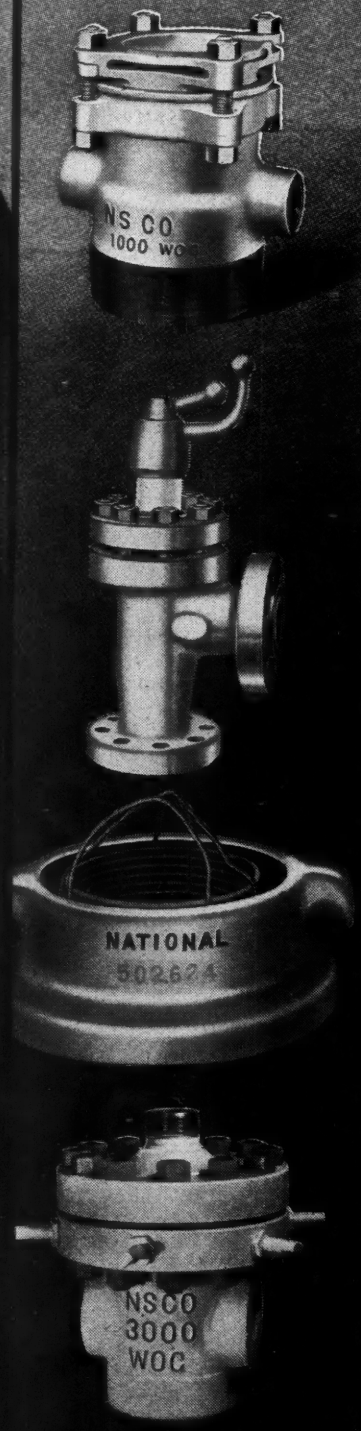
National Type "W" Tubing Head

An extremely flexible unit designed to support a string of tubing and to seal it from the casing. It is for use for working pressures from 1000 to 3000 PSI.

THE NATIONAL NSCO SUPPLY COMPANY

NATIONAL BLUE PRODUCTS

HEAD EQUIPMENT
INDIVIDUAL WELL REQUIRE



NATIONAL TYPE "B"
Pressure Pack Well Head Equipment

National Type "B" Pressure Pack Well Equipment provides a modern full opening line of safe, dependable equipment.

Safe construction and modern design provides a flexibility of interchangeable combinations of size, capacity and type to serve individual well requirements. Slip and Mandrel Casing Hangers, Plain Crossover, Safety Crossover, Regular Safety and Plain Slip Weld Flanges are interchangeable.

For Complete Details of National Type "B" Pressure Pack Well Head Equipment. Write for Bulletin No. 313.

THE NATIONAL SUPPLY COMPANY

GENERAL SALES OFFICES: TOLEDO, OHIO · DIVISION OFFICES: CASPER · FT. WORTH
PITTSBURGH · TULSA · TORRANCE · EXPORT: NATIONAL SUPPLY EXPORT CORPORATION,
30 ROCKEFELLER PLAZA, NEW YORK, N.Y., U.S.A. · RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON, E.C. 2

GOVERNMENT OWNED SURPLUS

PRIMACORD

APPROXIMATELY 23,000,000 FEET

PRICE $.015 PER FOOT, F. O. B. LOCATION

(Sale closes June 25, 1947)

PRIMACORD is a commercial detonating fuse used for firing high explosive blasting charges. It consists of an explosive core of PETN contained within a flexible, waterproofed fabric covering. It is about ¼" in diameter, weighs approximately 15 pounds per 1,000 feet, and has a tensile strength of 113 pounds. PRIMACORD is an extremely effective detonating agent due to the fact that PETN is a forceful explosive with a velocity of 20,350 feet per second.

PRIMACORD is a relatively safe detonant, is easy to handle, comparatively insensitive to shock, friction, or flame, and both the covering and the explosive core are water resistant. It can be fired by either an electric or non-electric blasting cap.

PACKAGED—On wooden spools in lengths of 50 feet, 100 feet and 1,000 feet.

***Minimum Quantity*—5,000 feet**

***Price*—1½¢ per foot, f. o. b. location, on any size spool.**

★ ★ ★

This material is available for sale at the following War Assets Administration Regional Offices in these approximate quantities. Offers to purchase may be made by letter, wire or personal visit to any of the Regional Offices listed. If your offer is written, mark your envelope, "Offer to Purchase Primacord, A-113,2058".

WAA also has available TNT, electric and non-electric blasting caps.

WAA OFFICES	FEET	50' SPOOLS	100' SPOOLS	1000' SPOOLS
Chicago	522,100	5,608	2,407	1
Cincinnati	3,871,350	6,848	35,289½	—
Grand Prairie	113,250	613	586	24
Denver	3,031,300	8,000	26,313	—
Los Angeles	2,552,500	19,914	15,158	41
Nashville	2,160,100	18,658	12,262	1
Omaha	148,700	—	—	—
Philadelphia	503,300	10,066	—	—
Salt Lake City	9,163,500	42,270	70,000	—
San Francisco	632,100	88	6,277	—
	22,698,200			

★ ★ ★

Purchasers of Primacord are required to observe all applicable laws regulating the sale, use, handling and storage of explosive materials.

USES

PRIMACORD is used as a detonating fuse for TNT, demolition blocks or other explosives and is more dependable than electrical fuses for insuring the simultaneous detonations of a number of charges assembled on a single line.

Fire Fighting—Trees can be felled merely by wrapping a few loops around each tree and detonating.

Digging Post Holes—Primacord can enlarge a small hole rapidly and cleanly, and consequently is most useful in telephone and telegraph line construction.

Control of Pine Bark Beetle—One loop of Primacord around a tree, upon detonation, will strip the bark from the tree.

Drainage Operations—Primacord is more effective than dynamite for running ditches through hard, dry ground.

Substitute for Blasting Caps—Primacord has already obtained widespread favor as a substitute for blasting caps because of its ease of handling, its relative insensitivity, and its efficiency.

★ ★ ★

Offers to purchase all or any part of the above material, f.o.b. location, will be accepted until noon June 25, 1947, by the Regional Office having the inventory. WAA reserves the right to reject any or all offers, to make awards in whole or in part, or to extend the period of the sale. Material is subject to withdrawal prior to contract of sale.

This is a concurrent and continuous sale. 5% of the total inventory will be reserved to fill orders received from Federal Agencies by noon on June 25, 1947. All other orders received by noon on this date will be filled in the following sequence: (a) Certified veterans of World War II, (b) Subsequent priority claimants, (c) Non-priority purchasers.

All orders received after this date will be filled without regard to priorities. Purchaser's order must state thereon: (a) "This order is subject to War Assets Administration Standard Conditions of Sale, and all other advertised terms and conditions, and no other terms or conditions should be binding on War Assets Administration", (b) Type of business and level of trade. Orders from veterans must show certification date, case number and location of certifying office.

OFFICE OF GENERAL DISPOSAL

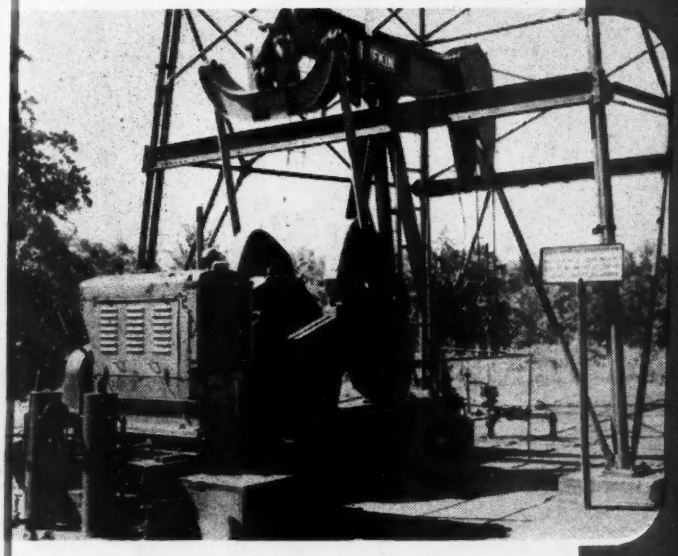
WAR ASSETS ADMINISTRATION

GOVERNMENT WAA SURPLUS

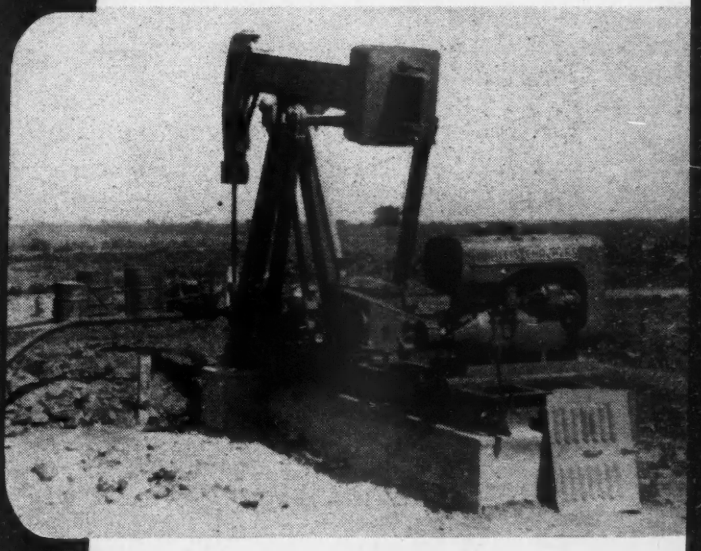
Offices located at: Atlanta • Birmingham • Boston • Charlotte Chicago • Cincinnati • Cleveland • Denver • Detroit • Grand Prairie, Tex. Helena • Houston • Jacksonville • Kansas City, Mo. • Los Angeles • Louisville • Minneapolis Nashville • New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa 1148

5 Sizes OF ALLIS-CHALMERS POWER UNITS to fit the Job....

Two A-C Model L Engines with 844 cu. in. piston displacement, 590 ft. lbs. torque, at 650 r.p.m., driving rotary table, draw-works and mud pump.

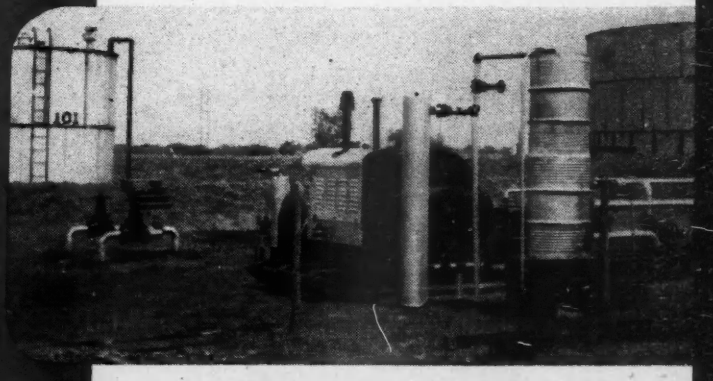


An A-C Model U Engine with 318 cu. in. piston displacement, 200 ft. lbs. torque at 900 r.p.m., on a heavy duty pumping unit producing a deep well.



Model B with 125 cu. in. piston displacement, 87 ft. lbs. torque, at 1,100 r.p.m., A-C Power Engine unit on a Tonkawa field well.

Two, A-C Model W Engines with 201 cu. in. piston displacement, 128 ft. lbs. torque at 1,100 r.p.m., connected with manifold driving mud pumps.

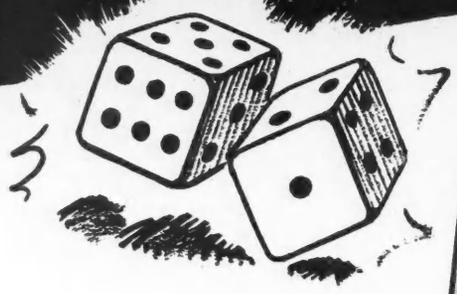


A Model E Engine with 563 cu. in. piston displacement, 400 ft. lbs. torque at 650 r.p.m., burning natural gas, hooked to a reciprocating oil line pump.

FRED Cooper

Use these EVERLASTING Valves...

Take the gamble out of your boiler blow-off!



A driller's job carries enough "headaches" as it is. He can't afford to gamble on the efficiency of his boiler blow-off valves.

As drillers have testified for years, the EVERLASTING name on a blow-off valve means dependable, trouble-free performance under long, hard usage. EVERLASTING's 40 years of experience and valve savvy have produced blow-off valves especially suited to oil-field service. And here's what makes these valves as good as users say they are . . .

- Straight-through blow—no clogging
- A drop-tight seal—maintained by pressure
- Quick action—direct and positive
- Only one moving assembly—post, lever-arm, disc
- Short lever-travel—less than a quarter-turn
- Self-grinding, self-polishing, self-lapping as disc moves across seat—dirt and scale can't lodge under disc
- Tough materials—resisting rust, corrosion, abrasion

These EVERLASTING Blow-off Valves have other good points, but you get the idea — they're *really trouble-free*. . . and tougher than any job you'll give them!

Sold by all leading Oil Field Stores

Fig. 1010-300, Regular EVERLASTING Valve, screw end, rack - and - pinion type, cast steel—equipped with Stellite faced disc—for 300-lb. oil-field boilers.

Fig. 1010-350, Special EVERLASTING Valve, screw end, rack - and - pinion type, cast steel—equipped with Stellite faced disc—for 350-lb. oil-field boilers.

EV-323

Everlasting Valves

GIVE "EVERLASTING" SERVICE

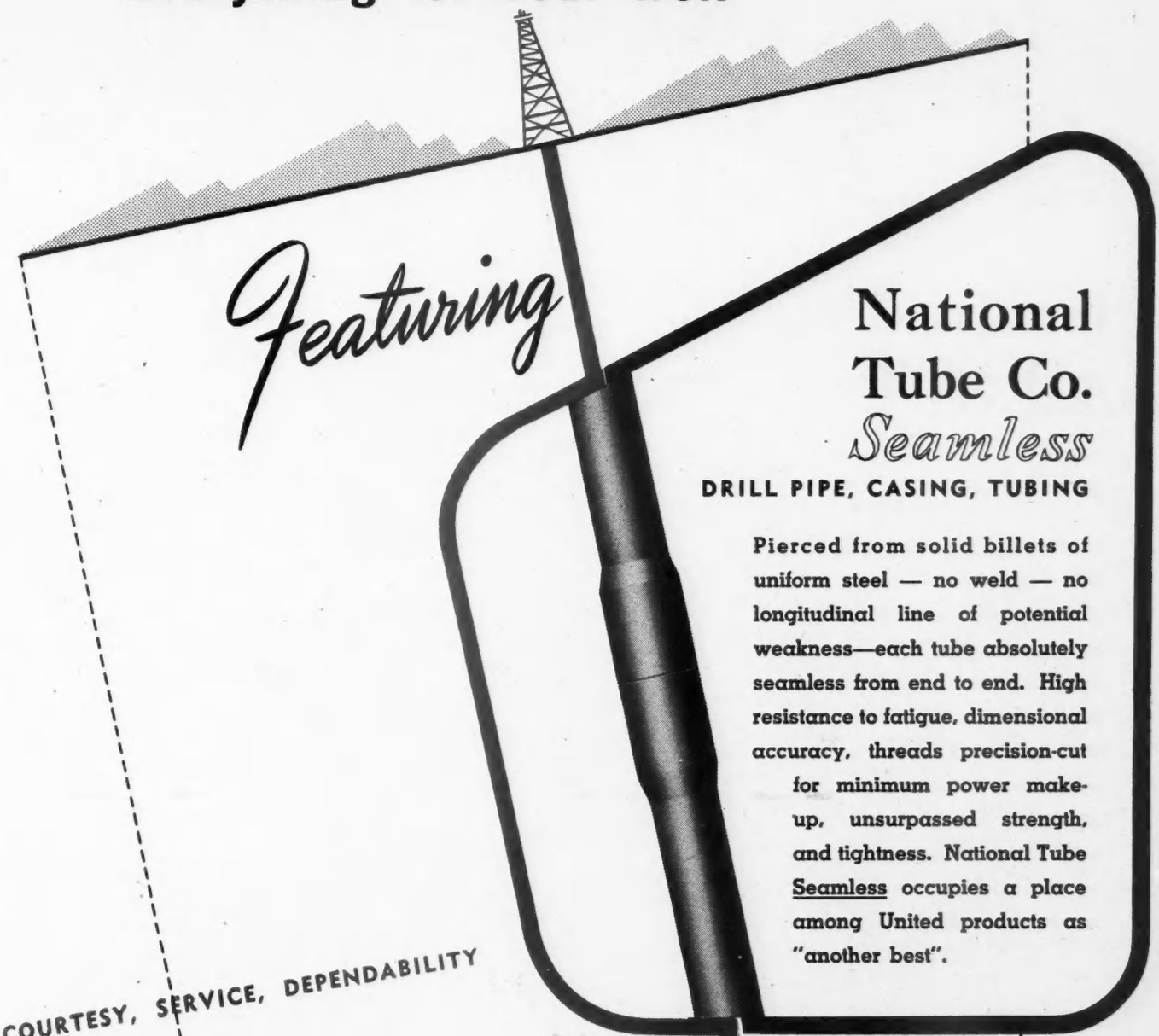
EVERLASTING VALVE COMPANY
49 FISK ST., JERSEY CITY 5, N. J.

Trade-mark "EVERLASTING"—REG. U. S. PAT. OFF.

Cellar to Sand

UNITED Supplies

Everything for Your Well



Featuring

National Tube Co. *Seamless*

DRILL PIPE, CASING, TUBING

Pierced from solid billets of uniform steel — no weld — no longitudinal line of potential weakness—each tube absolutely seamless from end to end. High resistance to fatigue, dimensional accuracy, threads precision-cut for minimum power make-up, unsurpassed strength, and tightness. National Tube Seamless occupies a place among United products as "another best".

COURTESY, SERVICE, DEPENDABILITY

UNITED STORES IN . . .

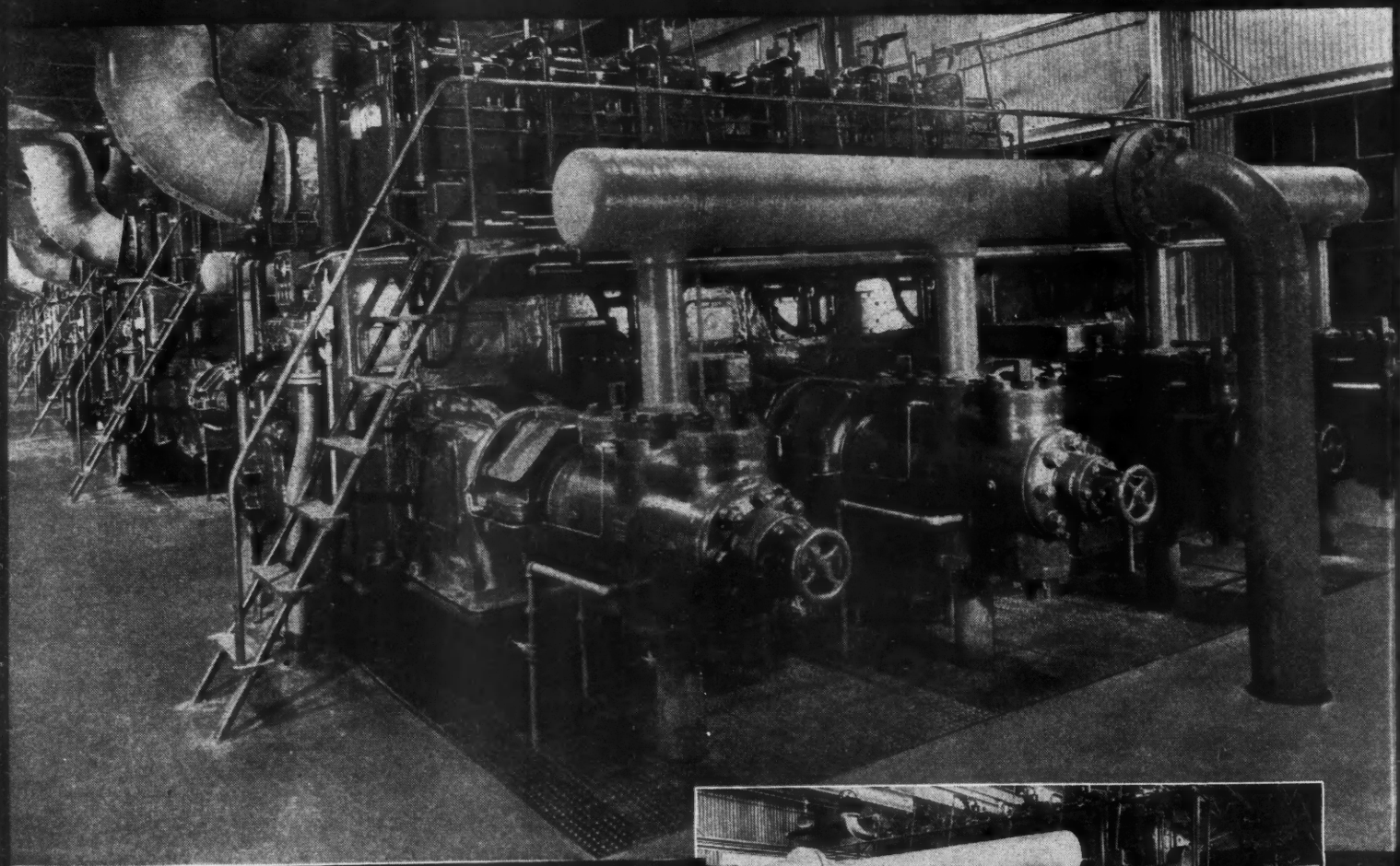
KANSAS
OKLAHOMA
TEXAS
LOUISIANA
NEW MEXICO

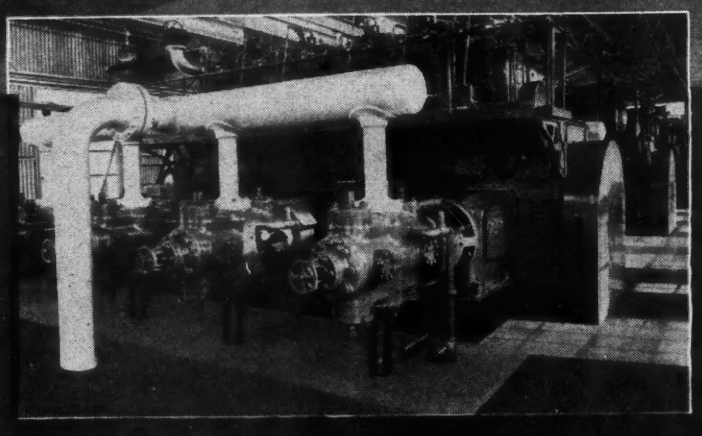
UNITED SUPPLY
AND *Manufacturing* COMPANY
TULSA, OKLAHOMA

GAS PIPE LINES HAVE CHOSEN

400,000 BHP of Clark Compressors

IN LAST TEN YEARS





The roll call of great pipe lines using Clark engine-compressors includes the following partial list of famous names:

Colorado Interstate Gas Co.
Consumers Power Co.
East Ohio Gas Co.
El Paso Natural Gas Co.
Hope Natural Gas Co.
Memphis Natural Gas Co.
New York State Natural Gas Co.
Panhandle Eastern Pipe Line Co.
Southern Union Gas Co.
Tennessee Gas & Transmission Co.

The proved performance of Clark units in this service is indicated by the impressive 10-year total of 400,000 BHP either in use or now in production, for gas pipe line stations exclusively.

More than one third of that total, or 145,200 BHP, consists of "Big Angle" Compressors, the first unit of which was placed in service 4½ years ago.

Rating 200 BHP per cylinder, the Clark "Big Angle" is the most powerful right angle gas-engine-driven compressor ever built. It is the answer to the need for *greater power in less space* and at *lower over-all cost.* Sizes: 5-cyl. 1,000 BHP; 6-cyl. 1,200 BHP; 8-cyl. 1,600 BHP; 10-cyl. 2,000 BHP.

Send for this descriptive bulletin

CLARK BROS. CO., INC., OLEAN, NEW YORK

Boston • Chicago • Houston • Los Angeles • New York • Tulsa • Washington
London • Caracas, Venezuela • Bucharest, Roumania

CLARK

ONE OF THE DRESSER INDUSTRIES

SETS THE PACE IN COMPRESSOR PROGRESS

L&H

FLAME HARDENED ALLOY-STEEL WATER COOLED RENEWABLE BRAKE RIMS

RID YOUR RIG OF BRAKE RIM TROUBLES
Thick flame-hardened case, 550-600 Brinell hardness.
Specially machined surface to expose maximum surface for water cooling.

Think OF "L&H"

WHEN YOU NEED:

Draw-works Repaired or Remodeled • Tool and Change Houses • Steel Mud Tanks • Metallizing — the spray-on method of galvanizing • Drill Pipe Subs • Engine Substructures • Skid Mounts • And such specialties as boiler jacks, adjustable pipe rollers, hammer-up jam nuts for pump rods, mud savers, pipe racks, etc.

These "L&H" Brake Rims reflect the many years of experience in draw-works designing and remodeling gained by our shop personnel. They are made from SAE-3140 (Chrome-Nickel) steel, flame-hardened to produce a tough, wear-resistant case of 550-600 Brinell approximately ¼-inch deep. The rims are carefully ground to close tolerance to assure uniform braking surface and equal distribution of wear on both rims and brake blocks.

"L&H" Brake Rims are available to fit most of the popular makes of draw-works.

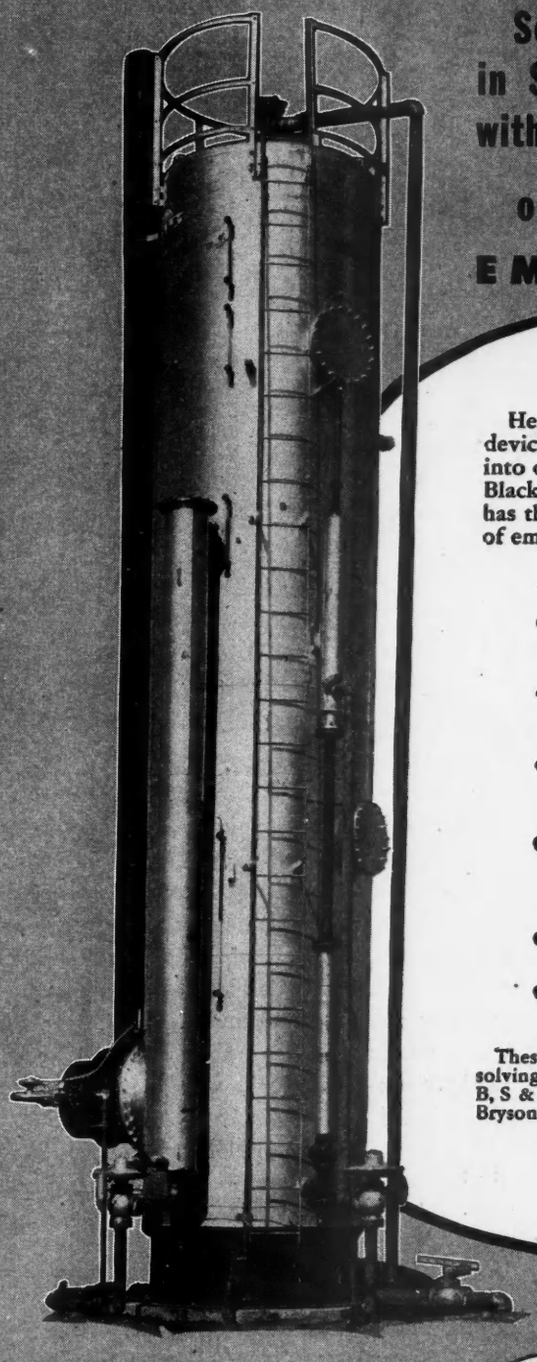
L&H MACHINE WORKS

2205 QUITMAN, HOUSTON, TEXAS

"24 Hour Service . . . Seven Days Per Week"

Definitely Superior

Set New Performance Standards in Separating Oil-Water Emulsions with the Improved, Exclusive Features of the BS&B EMULSION TREATER



Here, in one complete, self-contained unit is the device that effectively separates well production into dry gas, oil-free water, and clean oil. This new Black, Sivalls & Bryson Type "F" Stage Treater has these definite advantages over previous types of emulsion treaters:

- **Quiet, Gas-Free Settling Section.**
- **Large Settling Section** – allows more time for thorough separation of oil and water.
- **Two-Stage Free Water Knockout** – prevents drawing oil through water siphon and its loss in your disposal pit.
- **Single Outside Adjustable Water Siphon** – simplifies pipe hook-ups...makes the adjusting of the oil-water interface easy.
- **Gravity Loss Prevented by Treating Cycle** – condenses vapors driven from heated oil . . . stabilizes crude with its continuous condensing and vaporizing cycle.
- **High Gas Separating Capacity**—entire diameter of treater serves as a separator.
- **Four Standard Sizes**—4, 6, 8 and 10 foot diameter by 28 foot shell length.

These vital improvements can be of great aid to you in solving your production problems. Call in your nearest B, S & B man, or write Executive Offices, Black, Sivalls & Bryson, Power and Light Building, Kansas City 6, Mo., for new detailed booklet.

56

FOREIGN INQUIRIES INVITED — EFFICIENCY RELIABILITY — Cable Address: BLACK, KANSAS CITY, U.S.A.

BLACK, SIVALLS & BRYSON, INC.

KANSAS CITY, MO. CASPER, WYO. OKLAHOMA CITY, OKLA. CALGARY, ALTA.

RATIGAN

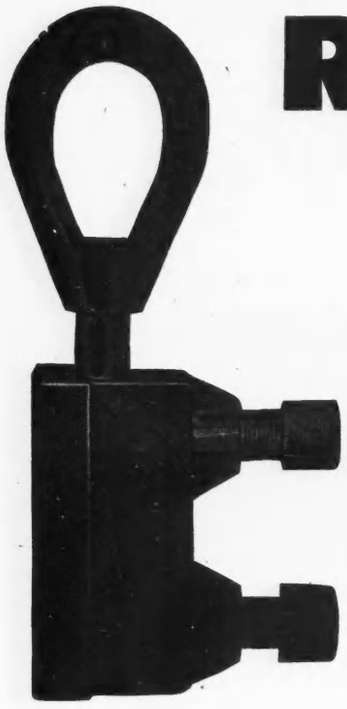
No. 204 & No. 205

open type

POLISH ROD GRIPS

with

GREATER Holding Capacity



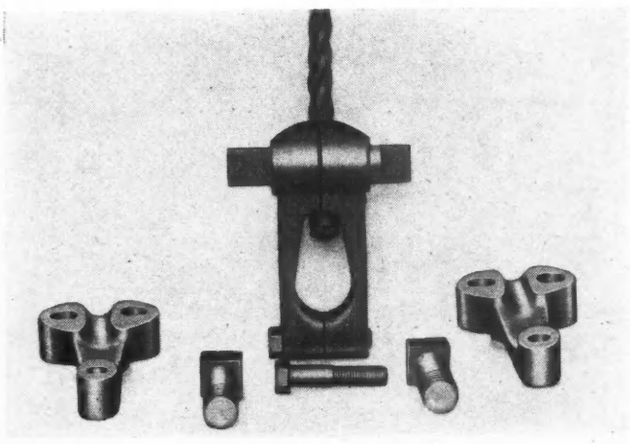
NO. 204

NO. 205

Ratigan No. 204 and No. 205 Polish Rod Grips each consist of three parts—the body, connecting block, and the gate—and are identical in capacity and mechanism except that trunnions are added to the No. 205. These trunnions should be at the bottom when operating.

The height of the No. 204 Grip is less than that of our No. 7, one of our popular screw type grips, and the body is approximately one-half the width; while the weight is considerably less. It will accommodate most of the carrier bars supplied by manufacturers of unitized pumping equipment.

The No. 205 Grip was designed as a combination carrier bar and grip, and will accommodate centers from 8" to 10". Due to the short distance between the horsehead and the stuffing box on present types of pumping units, we recommend using the No. 205 Grip with the Ratigan No. 181 Wire Line Clamp, shown below, which is adapted to the trunnions on this grip, and also is used extensively on all types of wire line horseheads.



NO. 181 WIRE LINE CLAMP

The trunnions on the No. 205 Grip allow more flexibility of the wire line between the trunnions and the bottom of the horsehead, and will prolong the life of the cable. Also, the No. 181 Clamp being short, the operator obtains the benefit of all the cable possible. The clamp eliminates babbitting, and keeps the lines in the center of both the grip and the polish rod, where they should be.

A comparison of the No. 204 and No. 205 Grips with two of our former major screw type grips is given in the table below:

Type	Approximate Holding Capacity	Approximate Weight	Price
No. 7 2-Screw	37,000 lbs.	30 lbs.	$25.00
No. 50 3-Screw	53,000 lbs.	45 lbs.	35.00
No. 204 2-Screw	53,000 lbs.	19 lbs.	25.00
No. 205 2-Screw (Trunnions)	53,000 lbs.	28 lbs.	35.00

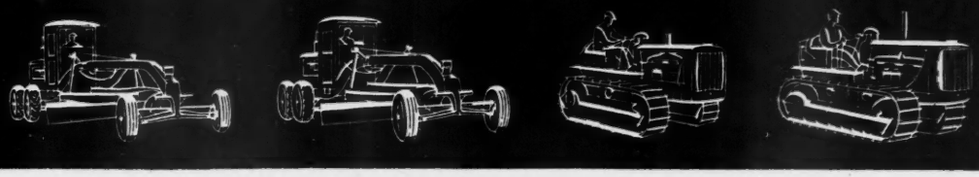
Ratigan Products are described on pages 3173 to 3192 in the 1947 Composite Catalog

J. P. RATIGAN, INC.

1213 South Santa Fe Avenue
Los Angeles 21 California

RATIGAN PRODUCTS ARE DISTRIBUTED THROUGH LEADING SUPPLY STORES

A new "FIGHTING FOUR"!



Now on the production lines are four new "Caterpillar" Diesel Tractors and Motor Graders—with decisively greater horsepower, strengthened design, and many mechanical refinements. . . . All brought to you in line with "Caterpillar's" policy of building ever better products for a steadily increasing number of satisfied users!

Without appreciable added weight, but with engines of increased piston displacement, still tougher materials, free-flow manifolding, larger crankshafts and numerous other improved features, these new "Caterpillar" Diesels enable you to *handle bigger loads—work at higher average speeds — accomplish more work per day — increase your earnings very substantially.*

These important advancements are the result of many months of quiet, patient but intensive "Caterpillar" engineering, metallurgical research, and factory tooling. They are dedicated to *your* future success and profits. You'll be delighted with the further details your "Caterpillar" dealer will gladly give to you.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

GREATER HORSEPOWER

FASTER WORKING SPEEDS

MANY IMPROVEMENTS

HIGHER EARNING CAPACITY

THE NEW TRACTORS

The D6—65 drawbar horsepower
2600 pounds additional pull in first

The D4—43 drawbar horsepower
1600 pounds additional pull in first

BOTH—36% larger crankshaft journals • 30% larger crankpins • Solid aluminum alloy bearings • Chrome-plated top piston rings • Free-flow manifolding, with individual ports for each cylinder • More effective, single-unit air cleaner • Improved fuel-injection pumps and injection valves • Improved lubricating oil cooling radiator • More effective oil-pressure control • Full-machined cylinder liners, with "no-corrosion" seals

THE NEW MOTOR GRADERS

The No. 12—100 brake horsepower

The No. 112—70 brake horsepower

BOTH—Constant-mesh transmission • Helical gears—for less noise and easier shifting • Arched front axle—for more ground clearance • Steering shock absorber and anti-friction bearings • Improved power-control clutch, with anti-coasting brakes • Other engine refinements as in Tractor engines

CATERPILLAR REG. U. S. PAT. OFF. **DIESEL** ENGINES • TRACTORS MOTOR GRADERS EARTHMOVING EQUIPMENT

Balanced diet for a mud hog!

When a mud hog "develops an appetite"—when circulation losses start costing money—how much mud can you afford to lose?

Prevent circulation losses with JELFLAKE

To "balance" the mud hog's diet—to avoid trouble before costly losses start—many operators add Jelflake to their drilling mud. Jelflake filters out on formation walls—seals off "thief" formations—saves drilling mud—pays its way many times over. It is a light, tough, fragmented foil which mixes thoroughly, holds its strength, will not ferment.

Jelflake is also used to prevent circulation losses in cementing operations. See your supply store or nearest Dowell station for Jelflake—the "low cost insurance." Keep Jelflake handy, ready for use. Dowell Services: Selective Acidizing, Mud Acid, Plastic, Electric Pilot and Chemical Scale Removal for boilers and heat exchange equipment. Other Dowell Products: Paraffin Solvents, Bulk Inhibited Hydrochloric Acid.

DOWELL

SEE YOUR SUPPLY STORE

Jelflake is available now through more and more outlets, as operators everywhere realize its value.

DOWELL INCORPORATED • TULSA 3, OKLAHOMA

Subsidiary of The Dow Chemical Company

Look to **DOWELL**

FOR OIL INDUSTRY CHEMICAL SERVI